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THE INFLUENCE OF THE CEREBRAL CORTEX ON GASTRO-INTESTINAL MOVEMENTS

JAMES W. WATTS, M.D.

PHILADELPHIA

After the publication of Cushing's[1] address on peptic ulcers and the interbrain and Keller's[2] paper on ulceration of the digestive tract following experimental lesions of the hypothalamus, it seemed desirable to study the effects of hypothalamic lesions on the gastro-intestinal tract of monkeys. Since monkeys had not previously been used in such experiments it was essential that a careful study be made of their gastro-intestinal tracts under laboratory conditions as a basis for interpreting changes that might follow hypothalamic lesions.

For this purpose complete autopsies were performed on all animals (eighty in number) that died or were killed during the year 1932-1933 (at the Laboratory of Physiology at Yale University School of Medicine),[3] attention being directed particularly to the intestine. In the course of these autopsies, intussusception with intestinal obstruction was found to be the cause of death in three otherwise healthy animals; all three intussusceptions occurred in monkeys that had been subjected to bilateral removal of parts of the frontal lobes (including the premotor area). Though suggestive of a relation between cortex and intestine, these observations would in themselves allow no definite conclusions, even though in 300 primate autopsies obstructive intussusception had not previously been encountered (1930-1933). We[4] were therefore led to investigate the influence on the gastro-intestinal activity exerted by the cerebral cortex. In the present paper a brief summary is presented of the results, with special reference to their clinical significance.

REVIEW OF THE LITERATURE

Stimulation.—During the latter part of the nineteenth century, experimental evidence accumulated which indicated that the cerebral cortex influenced gastro-intestinal movements. In 1876 Bochefontaine[5] pointed out that faradic stimulation of the region of the sigmoid gyrus of the dog caused peristaltic contraction of the pyloric region of the stomach, followed by inhibition of the pylorus itself, and that sometimes such stimulation caused increased movements of the small and large intestines. Often peristalsis of the large intestine so induced was so forceful that it carried the fecal contents ahead of it. These observations were substantially confirmed by Hlasko[6] and Openchowski[7] and greatly extended by Bechterew and Mislawski[8] and by Osipov.[9] Bechterew and Mislawski found that stimulation of certain points near the cruciate sulcus gave rise to vigorous movements of the gastro-intestinal tract, whereas excitation of others caused inhibition of these movements. Page May,[10] who used both dogs and monkeys, was unable to confirm Bechterew's results. More recently Sheehan[11] has found that stimulation of the monkey's frontal lobe rostral to the motor area causes no effect on the "resting" (unfed) stomach but frequently leads to prompt inhibition of peristalsis in the "active" (fed) stomach.

Release.—Only three years after Bochefontaine published his results, Ott and Field[12] observed that quiet peristalsis in the cat's intestine became very active after the brain had been sectioned posterior to the thalami. Similar results were obtained by Bechterew[13] and by Lurje,[14] indicating that some part of the brain rostral to the section exerts an inhibitory influence on peristaltic movements. In view of the work of Cushing[1] and of Beattie and Sheehan,[15] it is quite possible that the inhibitory influence may emanate to some extent from the hypothalamus; but the earlier studies on cortical stimulation, the more recent ones of Sheehan,[11] and the observations on experimental intussusception,[4] indicate that the cortex also plays an important part in regulating and inhibiting the activity of the intestine.

EXPERIMENTAL RESULTS

Under light ether anesthesia, various parts of the cortex were stimulated faradically for periods of from

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From the Neurosurgical Service of the Hospital of the University of Pennsylvania, Philadelphia, and the Laboratory of Physiology, Yale University School of Medicine, New Haven, Conn.

1. Cushing, Harvey: Peptic Ulcers and the Interbrain, Surg., Gynec. & Obst. **55**: 1 (July) 1932.
2. Keller, A. D.: Ulcerations of the Digestive Tract Following Experimental Lesions in the Hypothalamus, read before the Federation of American Societies for Experimental Biology, Philadelphia, April 30, 1932; published subsequently by Keller, A. D.; Hare, W. K., and D'Amour, M. C.: Proc. Soc. Exper. Biol. & Med. **30**: 772 (March) 1933.
3. Watts, J. W., and Fulton, J. F.: The Effect of Lesions of the Hypothalamus upon the Gastro-Intestinal Tract and Heart of Monkeys, Ann. Surg., to be published.
4. Watts, J. W., and Fulton, J. F.: Intussusception: The Relation of the Cerebral Cortex to Intestinal Motility in the Monkey, New England J. Med. **210**: 883 (April 26) 1934.
5. Bochefontaine: Étude expérimentale de l'influence exercée par la faradisation de l'écorce grise du cerveau sur quelques fonctions de la vie organique, Arch. de physiol. norm. et path. **3**: 140, 1876.
6. Hlasko, Bernhard: Beiträge zur Beziehung des Gehirns zum Magen, Inaugural Dissertation, Dorpat, E. J. Karow, 1887.
7. Openchowski: Ueber Contren und Leitungsbahnen fur die Musculature des Magens, Arch. f. Anat. Physiol. (Physiol. Abt.) **13**: 549, 1889.
8. Bechterew, Vladimir, and Mislawski, N.: Ueber centrale und periphere Darminnervation, Arch. f. Physiol. (supp. Band) **13**: 243, 1889.
9. Osipov, V. P.: Ueber die Rindcentra des Dickdarmes, Obozr. Psichiat. Neurol. **3**: 193, 1898.
10. May, W. P.: The Innervation of the Sphincters and Musculature of the Stomach, J. Physiol. **31**: 260-271, 1904.
11. Sheehan, D.: The Effect of Cortical Stimulation on Gastric Motility in the Monkey, J. Physiol., to be published.
12. Ott, S., and Field, G. B. W.: A New Function of the Optic Thalami, J. Nerv. & Ment. Dis. **6**: 654, 1879.
13. Bechterew, Vladimir: Die Functionen der Nervencentra, ed. 3, Jena, Gustav Fischer, 1911.
14. Lurje, quoted by Schwab, E.: Die Innervation des Darmes, in Müller, L. R.: Lebensnerven und Lebenstriebe, ed. 3, Berlin, Julius Springer, 1931.
15. Beattie, J., and Sheehan, D.: The Effects of Hypothalamic Stimulation on Gastric Motility, J. Physiol. **81**: 218 (May 21) 1934.

one to two minutes, precautions being taken to prevent the spread of the current.[4] With the abdominal cavity open and the intestine floated in warm saline solution, the visceral organs were observed directly. When the premotor area was stimulated, a latent period of about twenty seconds usually elapsed before changes in the gastro-intestinal tract occurred. A marked increase in peristaltic activity of the cecum and lower part of the small intestine was generally the first change noted, but in some animals striking "peristaltic rushes" were initiated in the colon by such a stimulus. Vigorous peristalsis of the small intestine also occurred, but more often ringlike bands of contraction developed during application of the stimulus, and these as a rule were not transmitted. The persistence of such sharply defined bands of contraction in one segment, aided by peristaltic waves from cephalad segments, resulted in some instances in the invagination of the active portion of the intestine into the lumen of the passive segment lying in continuity with it. Often the intussusceptions so produced were multiple, usually formed in the ileum, and did not persist permanently; i. e., did not cause obstruction under the conditions of the experiment.

Vigorous intestinal movements could be produced by stimulation of many parts of the premotor area, but not from every point within this area. The portion bordering on the superior precentral sulcus, from which Bucy and Fulton[16] obtained ipsilateral movements of the extremities, gave the most consistent increase in intestinal activity. Once activity had been aroused in the intestine by premotor stimulation, faradization of the prefrontal region and the postcentral gyrus sometimes caused augmentation of activity; but primary stimulation of these regions in the intact cortex were without effect. In one animal from which the premotor area had been extirpated five months previously, stimulation of the prefrontal region and the postcentral gyrus caused a slight increase in peristalsis but never obstruction. In no experiment did stimulation of the motor area, even when very strong, influence movements of the intestine. In some experiments, cortical stimulation caused increased secretion of gastric juice. Bilateral vagotomy abolished most of the cortical responses, though occasionally strong stimulation of the premotor area in such a preparation caused a slight increase in peristalsis. The consequences of sympathectomy were not studied.

COMMENT

Cortical Autonomic Epilepsy.—The experiments just described suggest an explanation of the long recognized visceral symptoms and signs associated with focal seizures in man, especially those which occur in the absence of increased intracranial pressure. When pressure is increased, the symptoms of nausea and vomiting cannot be attributed solely to cortical derangement. In uncomplicated focal seizures, however, visceral phenomena may be of localizing significance. Watts and Frazier[17] recently presented case histories of two patients in which manifestations such as nausea, epigastric distress and vomiting served to abort, or were substituted for, epileptic convulsions. In one instance, nausea followed by vomiting aborted individual focal seizures affecting the extremities. In the other instance several focal convulsions occurred early in the anamnesis; then followed an interval of four years in which there were periodic episodes of nausea, epigastric distress and vomiting, but no convulsions. After four years the characteristic convulsive seizures were resumed.

In their study of the cerebral localization of epileptic manifestations, Penfield and Gage[18] observed that an aura of pain or epigastric distress may arise from activity of the cerebral cortex. Under local anesthesia in conscious patients they found that stimulation of area 7a caused pain in the right lower quadrant of the abdomen in one case, and stimulation of the same area elicited an epileptic attack preceded by the usual epigastric aura in another.

The observations of Penfield and Gage[18] established sensory autonomic representation in the cortex for the gastro-intestinal tract in man. The experiments of Watts and Fulton[4] establish motor autonomic representation in the cortex for the gastro-intestinal tract in the monkey. Correlating these results with occurrence of epileptic manifestations such as nausea and vomiting, associated with focal epileptic convulsions or occurring alone as in the patients described, led Watts and Frazier[17] to postulate motor autonomic representation for the gastro-intestinal tract in the cortex of man. It is probable, therefore, that nausea, epigastric distress and possibly vomiting may be the result of neuronal discharge from the motor autonomic portion of the cerebral cortex. We also believe that the epigastric aura and other abdominal sensations usually are not "referred" sensations but rather the result of vigorous, and probably abnormal, movements of the gastro-intestinal tract.

Morbid Hunger.—Cases of morbid hunger following injury to the brain have been described by Paget,[19] Bechterew,[13] and Sollier and Delagenière.[20] In 1909 Spiller[21] reported a case of glioma occupying the whole pons, in which intense hunger was a prominent symptom, and remarked that he had observed two other cases of brain tumor presenting this symptom. It was Spiller's impression at that time that the location of the tumor was not significant in relation to the production of excessive hunger. In the following case the sudden appearance of excessive hunger was one of the first symptoms in a patient who subsequently proved to have a frontal tumor:

A man, aged 45, with a right frontal lobe tumor, in whom the sudden appearance of a ravenous appetite was one of the first symptoms, was referred to the neurosurgical service a few months ago by Dr. William G. Spiller. Associated with the onset of excessive appetite in 1930 were increased thirst, increased libido and morbid somnolence. Two years later generalized convulsive attacks developed, which usually began with the turning of the head to the left. Profuse sweating with a very offensive odor perceptible to other people was noted after each attack. On examination the man was found to have bilateral choking of the optic disks but no cranial nerve palsies and no motor or sensory disturbances. A ventriculogram showed evidence of a right frontal lobe tumor. A huge meningeal tumor in this region was exposed by Dr. Charles H. Frazier. Because of its extreme vascularity it was considered advisable to postpone its removal until a second stage, but unfortunately the patient died before this could be done. At autopsy the brain, which was examined by Dr. Bernard J. Alpers, revealed a very large, flat meningeal fibroblastoma,

16. Bucy, P. C., and Fulton, J. F.: Ipsilateral Representation in the Motor and Premotor Cortex of Monkeys, Brain **56**: 318 (Sept.) 1933.

17. Watts, J. W., and Frazier, C. H.: Cortical Autonomic Epilepsy, read before the American Neurolgoical Association, Atlantic City, June 5, 1934; J. Nerv. & Ment. Dis., to be published.

18. Penfield, W., and Gage, L.: Cerebral Localization of Epileptic Manifestations, Arch. Neurol. & Psychiat. **30**: 709 (Oct.) 1933.

19. Paget, S.: On Cases of Voracious Hunger and Thrist from Injury or Disease of the Brain, Tr. Clin. Soc., London **30**: 113, 1897.

20. Sollier, P., and Delagenière, H.: Le centre cortical des fonctions de l'estomac d'après un cas d'abces du cerveau d'origine traumatique, Rev. neurol. **9**: 1103, 1901.

21. Spiller, W. G.: Brain Tumor, J. A. M. A. **53**: 2078 (Dec. 18) 1909.

firmly adherent to the dura mater. It occupied almost the entire right frontal lobe, extending from the falx cerebri to the orbital gyri. The tumor completely covered areas F^1 and F^2, except for a small area at the frontal pole, and compressed most of F^3 and the precentral gyrus. The tumor could be separated from the brain only with difficulty. The under surface of the tumor was softened and necrotic, and the entire frontal lobe under the tumor was softened.

Two years ago Fulton, Jacobsen and Kennard [22] noted that monkeys, after bilateral removal of the frontal areas, ate several times as much as normal animals. In the belief that the ravenous appetite might be due to some metabolic disturbance, Bruhn [23] studied the basal metabolic rate of these animals as well as of normal monkeys. Bruhn's results soon made it apparent that in spite of their excessive appetites and activity these animals had a normal basal metabolic rate. However, he found that the basal metabolism may be elevated after bilateral premotor extirpation, presumably owing to spasticity of the extremities. In a recent discussion of morbid hunger, Fulton [24] said: "In view of the abnormal peristalsis of the gut resulting from these cortical lesions, it appears to me logical to suggest that symptoms of morbid hunger may be due to increased motility of the stomach, and that the cases of morbid hunger reported in the literature may also be attributed to this circumstance." This offers an explanation based on experimental evidence of a symptom that has long been a medical curiosity. It might be added that a part of the excessive appetite and the tendency toward emaciation may be the result of food being hurried through the alimentary canal at a rate that does not allow time for digestion and absorption to be completed.

SUMMARY

1. Removal of cortical influence by extirpation of both premotor areas results in increased peristalsis and in some instances in intussusception. Faradic stimulation of the premotor area and certain adjoining parts of the cerebral cortex initiates vigorous movements of all parts of the intestine. Evidence is given indicating that cortical representation for the gastro-intestinal tract contains both excitatory and inhibitory components.

2. Epigastric aura and other visceral sensations associated with focal convulsive seizures or occurring independently usually are not so-called referred sensations but result from vigorous and, perhaps, abnormal gastro-intestinal movements.

3. Morbid hunger associated with brain tumors, cerebral vascular disease and accidental injury to the brain is probably due to irritation or destruction of the intestinal representation in the cortex, or of tracts arising there.

University of Pennsylvania Hospital.

ABSTRACT OF DISCUSSION

DR. THOMAS J. HELDT, Detroit: In giving consideration to autonomic representation in the cerebral cortex, I suppose that this study may be regarded as dealing primarily with the preganglionic system of cells and fibers, or of their equivalents. What are the details of postganglionic expression, and how much thought has been given to stimuli more complex than those mentioned? Reference has been made to electrical stimulation and to stimulation by drugs. How much study has been made of the more complicated sensory stimuli and the psychic factors that are so difficult to rule out and to separate at the time of stimulation by simpler methods? I am wondering whether Dr. Watts has given special study to such factors as might be involved when a securely leashed dog is presented with food just out of reach. Multiple stimuli are certainly at hand. To what extent is such a complex sensory stimulus comparable to electrical stimulation? This is probably a relative matter, but how much of a discount must be allowed for such relative and complex stimuli in the full explanation of the functions and the cerebral representations under consideration? On the basis of the reflex arc response and the postganglionic innervation of viscera, what are the possibilities of a "short circuit," and how much "short circuiting" is possible without actual central and precentral representation?

DR. JAMES W. WATTS, Philadelphia: I agree with Dr. Quigley that one cannot say that movements of the gastro-intestinal tract are increased simply because there is an increase in appetite. As I said before, conclusions cannot be drawn from clinical cases of ravenous appetite associated with cerebral lesions, unless other factors have been excluded. In reference to one of Dr. Heldt's remarks, I may say that all the experiments were done under light ether anesthesia. On several occasions, when the anesthesia became light and the animal struggled, vigorous peristalsis occurred in the large intestine when ether was reapplied. I do not know what to attribute this to, whether fear or the emotions played a part. However, I do not think such peristalsis is related to the associated activity of the skeletal muscles because repeatedly stimulation of the motor area (area 4) has elicited the usual vigorous movements of the extremities but no movements of the gastro-intestinal tract.

22. Fulton, J. F.; Jacobsen, C. F., and Kennard, Margaret A.: A Note Concerning the Relation of the Frontal Lobes to Posture and Forced Grasping in Monkeys, Brain **55**: 224 (Dec.) 1932.

23. Bruhn, M. J.: The Respiratory Metabolism of Infrahuman Primates, Am. J. Physiol. **109**: 16 (July) 1934.

24. Fulton, J. F.: Some Functions of the Cerebral Cortex: Lecture 1. Autonomic Representation in the Cerebral Cortex, J. Michigan M. Soc. **33**: 175 (April) 1934.

UPPER MOTOR NEURON LESIONS

AN ANALYSIS OF THE SYNDROMES OF THE MOTOR AND PREMOTOR AREAS

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When confronted by a patient exhibiting loss or impairment of voluntary power, a clinical examiner sets about at once to determine whether the disturbance is in the muscles themselves or in the nervous system. The case history generally indicates which one is involved, and if the trouble proves to be nervous in origin, the next step is to decide whether the central or peripheral nervous system is primarily concerned. In current neurologic teaching a broad distinction is made between the paralyses resulting from lesions of the "lower motor neuron" and those due to interruption of the "upper motor neuron." The lower motor neuron has its beginning in the cells of the anterior horn and its ending in the skeletal muscles. The term upper motor neuron has reference to the pathways from the cerebral cortex conveying volitional impulses, directly or through intermediate neurons, to the anterior horn cells of the spinal cord.

The symptoms of lesions of the lower motor neuron, such as occur in poliomyelitis, are identical with those produced by cutting a motor nerve; i. e., voluntary power is completely destroyed in the affected muscles, reflexes are abolished, the affected extremity is flaccid, and electrical stimulation reveals the typical "reaction of degeneration" (table 1). Contractures and other

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deformities are prone to develop, owing to unopposed action of nonparalyzed muscles.

The conventional distinctions between upper and lower motor neuron lesions are indicated in table 1 (after Campbell Thomson and Riddoch [1]). The symptoms of lesions of the upper motor neurons are, however, much less uniform than is indicated in the table, and considerable confusion exists as to their nature. This is due in large measure to the fact that lesions observed clinically seldom involve a single projection system. Furthermore, previous physiologic studies bearing on the subject have generally not been described in clinical terms, and their significance has accordingly escaped notice. It is therefore proposed in the present paper to interpret the upper motor syndromes of clinical neurology in the light of recent neurophysiologic investigations on monkeys and the higher apes, the terms of clinical literature being used for descriptive purposes.

CORTICAL PROJECTION SYSTEMS RESPONSIBLE FOR VOLUNTARY MOVEMENT

In the past, the upper motor neuron has been identified solely with the pyramidal tract in the erroneous belief that voluntary reactions are mediated only through the corticospinal pathways from the motor area.[2] From observations on man and chimpanzees it is now known that the region of the cerebral cortex lying anterior to the motor area,[3] generally referred to as the "intermediate precentral" or "premotor" region and shown in the accompanying illustration, also mediates voluntary reactions through its own corticospinal tracts or through its subcortical connections. In monkeys and chimpanzees from which the motor areas have been completely removed and the pyramidal tracts degenerated, voluntary movements of a fairly high order of complexity are eventually regained. When the premotor areas are also removed from both cerebral hemispheres, these movements disappear and the animal becomes permanently paralyzed. In any consideration of the upper motor neuron, therefore, one wishes to know to what extent the lesion involves the pyramidal pathways from the true motor area, and to what extent the nonpyramidal premotor pathways. This can be readily ascertained through a knowledge of the symptoms produced by isolated lesions of the motor and premotor areas respectively. Section of the pyramids themselves, as for example at the decussation, cannot answer the question, for it has recently been shown that corticospinal fibers from the premotor area actually pass to the spinal cord along with the pyramidal fibers of the motor area.[4]

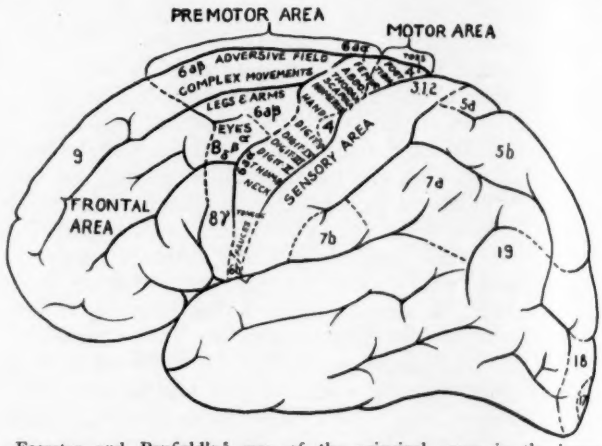
TABLE 1.—*Upper and Lower Motor Neuron Lesions as Conventionally Contrasted* *

	Lesion of Upper Neuron	Lesion of Lower Neuron
1. Wasting	Slight	Marked
2. Reflexes	Deep increased Babinski present	Abolished
3. Rigidity	Spastic	Flaccid
4. Electrical reactions	No change	"Reaction of degeneration"
5. Contractures	Marked and according to set patterns	Irregular

* After Campbell Thomson and Riddoch.[1]

EXPERIMENTAL LESIONS OF THE "UPPER MOTOR NEURON"

A. *Ablation of the Motor Area.*—When the cells of origin of the pyramidal tract are removed in man or chimpanzee by ablation of the motor area, the affected extremities exhibit complete paralysis of voluntary movement for a period varying from two days to a week.[5] During this period the limbs are flaccid with depressed or absent reflexes, and marked wasting of the muscles is likely to set in. There is no vasomotor disturbance, however, and no gross change in electrical reactions, though the excitability as determined by chronaxia measurement is said to be altered.[6] Voluntary motor power begins to return, generally within the first week, appearing first at the hip and shoulder, then at the knee and ankle, and finally in the digits. At no stage during the recovery of voluntary power in the chimpanzee do the extremities become spastic; deep reflexes generally reappear when voluntary power returns, and the knee and biceps jerk may in the course of time become somewhat hyperactive, even though the extremities themselves remain flaccid. The Babinski and Chaddock reflexes develop when the deep reflexes return and remain permanently present,[5b] while the fanning sign of Babinski and the Hoffmann and Rossolimo reflexes are absent (table 3 [7]). A pure motor area lesion causes no "intellectual" deficit, i. e., no loss of memory or mental confusion, even when bilateral.[8]



Foerster and Penfield's [5] map of the principal areas in the human cortex with Vogt's numerical designations. The exposed surface of area 4 is relatively small. The chief exposed area of electrical excitability lies in area 6.

1. Campbell Thomson, H., and Riddoch, G.: Diseases of the Nervous System, ed. 4, London, Cassell & Co., 1925.

2. Fulton, J. F., and Kennard, Margaret A.: A Study of Flaccid and Spastic Paralyses Produced by Lesions of the Cerebral Cortex, A. Research Nerv. & Ment. Dis. **13**: 158 (April) 1934.

3. Bucy, P. C.: The Relation of Cyto-Architecture of the Frontal Lobes of Primates to Functional Activity, Arch. Neurol. & Psychiat. to be published.

4. Kennard, Margaret A.: Corticospinal Fibers Arising in the Premotor Area of the Monkey, as Demonstrated by the Marchi Method, Arch. Neurol. & Psychiat., to be published. Hoff, E. C.: The Distribution of Bouton Terminations of Corticospinal Fibers Arising in the Premotor Area of the Monkey, ibid., to be published.

5. (*a*) Leyton, A. S. F., and Sherrington, C. S.: Observations on the Excitable Cortex of the Chimpanzee, Orang-Utan and Gorilla, Quart. J. Exper. Physiol. **11**: 135 (July) 1917. (*b*) Fulton, J. F., and Keller, A. D.: The Sign of Babinski: A Study of the Evolution of Cortical Dominance in Primates, Springfield, Ill., Charles C. Thomas, 1932. (*c*) Foerster, O., and Penfield, W.: Der Narbenzug am und im Gehirn bei traumatischer Epilepsie in seiner Bedeutung für das Zustandekommen der Anfälle und für die therapeutische Bekämpfung derselben, Ztschr. f. d. ges. Neurol. u. Psychiat. **125**: 475, 1930.

6. Bourguignon, G.: La chronaxie chez l'homme: Etude de physiologie générale (normale et pathologique) des systèmes neuromusculaires et sensitifs, Paris, Masson et Cie, 1923.

7. (*a*) Kennard, Margaret A., and Fulton, J. F.: The Localizing Significance of Spasticity, Reflex Grasping, and the Signs of Babinski and Rossolimo, Brain **56**: 213 (July) 1933. (*b*) Schick, William: Reflex Changes After Injury to the Pyramidal Tract in the Macaque, Gibbon and Chimpanzee, Arch. Neurol. & Psychiat. **30**: 501 (Sept.) 1933.

8. Jacobsen, C. F.: Influence of Motor and Premotor Area Lesions upon the Retention of Skilled Movements in Monkeys and Chimpanzees, A. Research Nerv. Ment. Dis. **13**: 225 (April) 1934; Functions of the Frontal Association Areas in Primates, Arch. Neurol. & Psychiat., to be published.

B. *Premotor Lesions.*—Following isolated removal of the premotor area, profound motor disability occurs, which lasts, both in man and in the chimpanzee, for four or five days. Immediately after such a lesion, however, the affected extremity becomes highly spastic; no wasting occurs, electrical excitability is normal, and certain characteristic pathologic reflexes, such as forced grasping, the fanning sign of Babinski and the signs of Rossolimo, Mendel-Bechterew and Hoffmann, develop (table 3). There is also profound vasomotor disturbance, the affected extremity losing for a time its power of reflex vasodilatation and sweating.[9] Voluntary power begins to return simultaneously in all parts of the extremity, generally from four to five days after the lesion, but skilled movements, such as those necessary to play the piano, to "finger" a violin or to tie a shoe-lace, become permanently impaired and the impairment can be demonstrated long after such a lesion has occurred. Spasticity, forced grasping and vasomotor disturbance, however, tend to disappear with the return of voluntary power.[7a] In chimpanzees these symptoms reappear in all four extremities when a premotor lesion is made in the opposite hemisphere. This indicates the existence of bilateral representation in each hemisphere.[10]

Following premotor lesions there is some "intellectual" deficit in that the "memory" for acquired skilled movements is lost, but reeducation is possible.[8]

C. *Combined Motor and Premotor Lesions.*—When the motor and premotor areas are simultaneously removed from one hemisphere, the affected extremities are at first flaccid with depressed reflexes (pyramidal tract effects); but strong spasticity, reflex exaggeration and vasomotor disturbances are prone to develop within three or four days (nonpyramidal premotor effects). The signs of Babinski, Chaddock (pyramidal), Rossolimo, Mendel-Bechterew and Hoffmann together with the fanning sign of Babinski (nonpyramidal) are likely to be permanently present (table 3).

TABLE 2.—*Symptoms of Voluntary Paralysis*

	Upper Motor Neuron Lesions		Lower Motor Neuron Lesions (Anterior Horn Cells or Peripheral Motor Nerve)
	Pyramidal (Motor Area)	Nonpyramidal (Premotor Area)	
1. Rigidity	Flaccid or normal	Spastic	Flaccid
2. Deep reflexes*	Depressed at first	Greatly augmented	Abolished
3. Superficial reflexes (lower limbs)	Flexor exaggeration with Babinski	Extensor exaggeration	Abolished
4. Muscular atrophy	Marked	None	Very marked
5. Electrical reactions	Transient ? depression	No change	"Reaction of degeneration"
6. Contractures Lower limbs	Flexion	Extension	Irregular, depending on treatment and on action of nonparalyzed muscles
Upper limbs	Slight and variable	Flexion and adduction	

* See table 3.

A capsular hemiplegia in man may destroy chiefly the motor pyramidal radiations (if at the genu) or chiefly the premotor radiations (if in the anterior limb), but there is much overlapping in the two projection systems as they pass through the capsule, and a vascular accident in this region generally destroys both systems. The symptoms present in hemiplegia therefore are usually those of a combined motor and premotor lesion with both the pyramidal and nonpyramidal reflexes demonstrable.[11] The size and approximate position of the lesion may be estimated from the reflexes actually present, and from this some indication as to prognosis can be obtained, for if only pyramidal tract signs are exhibited the return of motor power will be more extensive than if the premotor reflexes are present as well; and, conversely, if only premotor reflexes are present without pyramidal tract signs the ultimate prognosis is even better.

TABLE 3.—*Reflex Changes Following Unilateral Upper Motor Neuron Lesions (Cortical)*

	Motor (Pyramidal)	Premotor (Nonpyramidal)	Combined Motor and Premotor
Babinski	+	0	++
Chaddock	+	0	+
Spasticity	0	++	+++
Toe fanning	0	+	+
Rossolimo	0	+	++
Mendel-Bechterew	0	+	++
Forced grasping	0	+	+
Hoffmann	0	+	++
Tendon	+*	++	+++
Abdominal	0	?	0
Vasomotor disturbance	0	++	++

* Depressed or absent in early stages following a motor area lesion.

THE SYNDROME OF THE MOTOR AREA

It is thus possible readily to differentiate motor from premotor pareses on the basis of the specific reflexes indicated in table 3. The pure motor area syndrome, however, rarely occurs clinically, but it is seen following discrete gunshot wounds, occasionally from small sharply localized tumors, and it has been produced by neurosurgeons [12] in the treatment of athetosis and focal seizures (excision of cortical scars). The characteristics of the syndrome may be summarized as follows:

1. *Motor Power.*—There is gross loss of motor power in specific muscle groups. Thus, if the motor area for the hand has been removed, the digits are completely paralyzed for days or weeks; if the lesion is sharply restricted, motor power in other muscles of the same extremity, e. g., biceps or triceps, may be entirely normal. The focal character of motor area paralyses is their most striking characteristic. Foerster and Penfield,[5c] for example, describe paralyses of the interossei of two fingers produced by a tuberculoma the size of a pinhead in the finger representation.

2. *Focal Seizures.*—With expanding lesions of the motor area, focal seizures of the jacksonian type are common. Such seizures begin characteristically with a single muscle group, such as the flexor of the index or hallux, and proceed to involve other muscles of the extremity in definite sequence. The "march" of symptoms in such cases often is exactly the same in all seizures. The motor area seizures thus stand in sharp contrast with the premotor, which begin with a complex pattern of movement generally involving a whole extremity.

3. *Reflex Changes.*[7a]—These have been enumerated in table 3. They vary to a certain extent with the nature of the lesion. If a given area is surgically excised, all reflexes in the affected muscle are abolished

9. Kennard, Margaret A.: Vasomotor Representation in the Cerebral Cortex, Science **79**: 348-349 (April 13) 1934; Vasomotor Disturbances Resulting from Cortical Lesions, Arch. Neurol. & Psychiat., to be published.

10. Bucy, P. C., and Fulton, J. F.: Ipsilateral Representation in the Motor and Premotor Cortex of Monkeys, Brain **56**: 318 (Sept.) 1933.

11. Davison, Charles, and Bieber, Irving: The Premotor Area and Its Relation to Spasticity and Flaccidity in Man, Arch. Neurol. & Psychiat. **32**: 963 (Nov.) 1934.

12. Foerster and Penfield.[5] Sachs, E.: Unpublished data. Spurling, G.: Unpublished data.

for a variable period. If, on the other hand, the lesion has been made by a gradually expanding tumor, the initial stage of reflex depression may be minimal or entirely absent. The only well recognized pathologic reflexes in the lower extremity associated with interruption of the pyramidal tracts are those of Babinski and Chaddock.

4. *Flaccidity.*[13]—Resistance to passive manipulation of an extremity whose pyramidal control has been destroyed is generally less than normal and is certainly never increased. This is true despite the fact that some of the deep reflexes, such as the knee and the ankle jerk, may be exaggerated. Knee and ankle clonus are generally not demonstrable, and changes of resting posture with alteration of the position of the body in space do not occur. During the Great War, Head[14] described cases of cortical "hypotonia" following shrapnel injuries of the postcentral convolution. Careful scrutiny of his case histories indicates that in all instances the lesion was adjacent to the central sulcus and therefore undoubtedly involved the motor area within the sulcus. In view of recent experimental studies it seems likely that the "hypotonia" in these cases is due, not to the postcentral involvement, but to the destruction of the motor area itself.

5. *Miscellaneous Symptoms.*—There is no loss in the patterns of movement in motor area lesions, and if a specific muscle, e. g., of the finger, is weak the remaining muscles of the extremity are capable of carrying out any previously acquired skilled movements with accustomed dexterity, which is in sharp contrast with premotor lesions. Similarly, there is no vasomotor disturbance or other signs of autonomic involvement with motor lesions.

THE SYNDROME OF THE PREMOTOR AREA

The differences in the motor and premotor syndromes might be predicted on the basis of their differing response to faradic stimulation. Stimulation of the motor area gives sharply restricted focal responses, whereas stimulation of the premotor region evokes complex patterns of movement. In keeping with this, isolated extirpation of the premotor area, or gradual destruction of it by tumor, gives rise to a series of disturbances that generally appear in clinical cases in the following chronological sequence:[15]

1. *Disturbance of Skilled Movements.*—Appearing first in clinical cases and persisting longest after experimental lesions, disturbance of skilled movements may be regarded as the primary symptom of a premotor lesion. Long before any impairment of the grip occurs or of gross movements such as those involved in walking and climbing are found, awkwardness may be present and skilled acts such as those previously enumerated are rendered impossible. The deficit is then one involving the coordinated activity of the musculature as a whole.

2. *Seizures.*—The seizures from premotor lesions begin similarly with a complex movement,[5] generally with turning of the head and eyes to the opposite side ("adversive" seizures), followed by a complex pattern of movement affecting one or both extremities on the opposite side, and often involving to a slight extent the extremities on the same side.

3. *Reflex Changes.*—After skilled movements have become affected, deep reflexes become markedly increased, and such pathologic signs as those of Rossolimo, Mendel-Bechterew and Hoffmann generally develop (table 3).

4. *Spasticity.*—With the appearance of the foregoing reflexes, the resistance of the extremity to passive manipulation gradually increases, and strong spasticity may ultimately result.

5. *Forced Grasping.*[16]—A special manifestation appearing late in the anamnesis of clinical cases and disappearing early following experimental lesions is the prehension phenomenon generally referred to as "forced grasping." It is pathognomonic of a premotor lesion. If forced grasping is poorly developed it can generally be brought out by placing the patient in the lateral position with the affected extremity uppermost, which is the maximal position for the reaction. The Babinski response is generally not present, although lateral deviation of the toes may occur; occasionally exaggerated flexion of the toes is seen in response to plantar stimulation.

6. *Vasomotor Disturbances.*[9]—The temperature regulation in the affected extremities after a premotor lesion may be disturbed, owing to paralysis of the mechanism for reflex dilatation and reflex sweating.

When lesions occur in the spinal cord or the brain stem, usually both the pyramidal and the nonpyramidal components of the upper motor neuron are affected, and the mixed syndrome is the result. Upper motor neuron lesions of this type are even more complex than those originating in the cortex, since the subcortical motor projection systems are often involved along with cortical systems. But the subcortical extrapyramidal systems are of no concern in this paper, since in mature animals they do not mediate voluntary movements.

SUMMARY

Paralysis of voluntary movement may be due to lesions of either the upper or the lower motor neurons. The manifestations of lower motor neuron lesions are identical with those following section of a motor nerve. Manifestations of upper motor neuron paralysis are various, and in the past no attempt has been made to dissociate the symptoms produced by destruction of the pyramidal pathways from those produced by interruption of other voluntary projection systems from the cortex. Recent studies on the specific components of upper motor neuron lesions in monkeys, apes and man allow the following conclusions:

1. Lesions restricted to the pyramidal tracts or to their cells of origin cause flaccid motor paralysis, muscle atrophy, transient depression of all reflexes, and the positive signs of Babinski and Chaddock; after complete destruction of the pyramids, the signs of Babinski and Chaddock persist permanently, but the paralysis, flaccidity and reflex changes tend with time to disappear.

2. Lesions of the premotor projection area of the cortex, which also mediate voluntary movements, give rise to spastic paralysis, disturbance of skilled movements, forced grasping, vasomotor disturbances, increased deep reflexes and the signs of Rossolimo, Mendel-Bechterew

13. Fulton and Kennard.[2] Kennard and Fulton.[7]

14. Head, Henry: Sensation and the Cerebral Cortex, Brain **41**: 57, 1918; reprinted in Head, Henry: Studies in Neurology **2**, 716, 1920.

15. Kennard, Margaret A.; Viets, H. R., and Fulton, J. F.: The Syndrome of the Premotor Cortex in Man: Impairment of Skilled Movements, Forced Grasping, Spasticity and Vasomotor Disturbance, Brain **57**: 69 (May) 1934.

16. Richter, C. P., and Hines, Marion: Experimental Production of the Grasp Reflex in Adult Monkeys by Lesions of the Frontal Lobes, Am. J. Physiol. **101**: 87 (July) 1932. Adie, W. J., and Critchley, M.: Forced Grasping and Groping, Brain **50**: 142 (June) 1927. Fulton, J. F.: Forced Grasping and Groping in Relation to the Syndrome of the Premotor Area, Arch. Neurol. & Psychiat. **31**: 221 (Feb.) 1934. Viets, H. R.: Forced Grasping in Man and Its Localizing Significance, New England J. Med. **210**: 675 (March 29) 1934.

and Hoffmann. Forced grasping and vasomotor disturbances are transient, but disturbance of skilled movements and the signs of Rossolimo and Hoffmann tend to persist.

3. Hemiplegia in man is generally produced by combined destruction of motor and premotor components of the upper motor neuron, and hence such cases generally exhibit combinations of the foregoing symptoms with more severe ultimate motor paralysis than when only the pyramidal tracts are involved. The prognosis can be inferred from the extent to which the two systems are involved.

ABSTRACT OF DISCUSSION

DR. I. S. WECHSLER, New York: The most outstanding sign of frontal lobe impairment is akinesia, both motor and psychic. The akinesia is probably due to lack of attention, and so is the memory defect. Memory consists of attention, association, retention and recollection. The frontal lobe patient lacks the first element of memory. The next defect is inability to associate; hence the loss of recent memories. Another frontal lobe sign or symptom is loss of inhibition. From these defects derive some of the mental symptoms, although it is difficult to speak in psychiatric terms of frontal lobe syndromes. Heretofore acute flaccidity in hemiplegia used to be explained by shock, no one really knowing what "shock" means, and chronic flaccid hemiplegia by a parietal lobe lesion; that is, by loss of tonus due to cortical or posterior column type of sensory impairment. If what the authors say is correct, and I think it is, there is a better explanation. It may be that the flaccidity is due to the overactivity of the premotor area 6 when the motor area 4 is destroyed. The work of Olmstead and Warner showed the rôle of the frontopontocerebellar pathways on tonus: stimulation of the cut fibers in decerebrate preparations induced flaccidity. The question of bilateral innervation is of importance because it throws light on bilaterality of signs in unilateral lesions. The usual explanation given is that the patient has more than one lesion. This is often true in vascular disease; but, if bilateral innervation is correct, temporary and minor signs opposite to the paralyzed side may be due to impairment of ipsilateral fibers. As to grasping and groping, experimental work points fairly conclusively to the frontal and premotor areas. I should like to suggest that the carphologia observed in infectious and other deliriums and in patients who show certain mental pictures is a grasping and groping phenomenon. The question of flaccidity and spasticity may throw light on the problem of hemiplegia in flexion and hemiplegia in extension. It may well be that the explanation lies in the involvement of different parts of the brain or different fiber systems. Thus, if the premotor area is affected, the hemiplegia is in extension; if the motor, the hemiplegia is in flexion.

DR. JOHN L. ECKEL, Buffalo: I have followed the work of these contributors for a number of years and feel that they are attacking this very complex problem in the only way that will insure accurate results. I agree with Dr. Bucy that the interpretation of symptoms from lesions due to a surgical condition, or resulting from disease of vessels, or any other process, is rather unsatisfactory. Some years ago Dr. Winkelman and I endeavored to work out the origin and course of the frontopontocerebellar tract from pathologic material only, and our results were rather disappointing, because of either too much destruction of tissue or of overlapping of lesions. The value of the work of these investigators is that they have established their syndromes experimentally and then correlate clinically in man as opportunity arises. Drs. Fulton and Viets had one or two clinical cases in man showing a premotor syndrome, which proves the point of their paper. If the authors would give the symptomatology and results of examination of that case it would help to fix the problem in the minds of those present. The great value to the clinician of this presentation is the table. When this appears in print one may carry it with him to the bedside and compare the symptoms of his patient with the chart, which will assist greatly in properly evaluating the symptoms at the bedside. The work of the authors clears up many of the confusing symptoms and signs that one finds in various types and degrees of hemiparesis and hemiplegia. Their work leaves the thought with me that the vast majority of lesions will show combined symptoms. A purely focal lesion in area 6, resulting from gunshot wounds, a stab wound, a focal thrombosis or a small expanding lesion, will show wholly premotor symptoms, while those situated deeper in the brain at the capsule or in the spinal cord will of necessity show combined symptoms of motor and premotor area involvement.

DR. J. B. AYER, Boston: It is not uncommon to have a hemiplegia which, as time goes on, recovers unequally. The leg function will return rather better than the arm function, and both as a rule will be spastic in character. That is the usual picture, with the finer movements of the hand lagging behind the movement of the lower extremity. That perhaps can be explained by the authors' physiologic work. I have two cases in mind in which, after months in one and after two years in the other, the arm remained absolutely inactive, and, while not flaccid, the reflexes are not very lively. There is a little atrophy, which perhaps might be secondary in type. The sensation is perfect. It is not a spastic arm in any sense of the word. The leg has become absolutely spastic. How is one going to explain that? One could think that, from the physiologic analysis, area 4 has been completely obliterated so far as the arm is concerned, but not so far as the leg is concerned. Then the question of the premotor control comes in and it brings up a very important question. Is there localization in the premotor area? Can the premotor area pick out the leg area and omit the arm area in producing spasticity?

DR. WALTER FREEMAN, Washington, D. C.: There are a few signs in patients with lesions of the frontal lobes that might also be observed in animals. In patients with slight lesions in the premotor area, and without disturbance of the motor area (apparently because there is no Babinski sign) one is apt to get a strongly positive Mayer sign. This is produced by forced flexion of the fourth finger, and the sign is the adduction and opposition of the thumb. In the same way, in the lower limb by tapping at the base of the toes one can sometimes produce a slight clutch reaction, which is very much like that found in the infant. The authors and I suffer some disagreement, possibly, over the term "spasticity." Spasticity, as I understand it, is a condition in which there are pathologic reflexes and also the characteristic lengthening and shortening reaction that one finds ordinarily in the classic hemiplegia. In individuals presenting lesions in the premotor area, on the other hand, one observes a condition of tonic preparation or tonic innervation, which of course is the main cause of the impairment of skilled movements. In cases of hemiplegia, speaking of homolateral innervation, there is weakness of such muscles as the sternocleidomastoid and the lingual muscles on the homolateral side. Homolateral innervation is equally well shown during convulsive seizures in which, for instance, given a jacksonian seizure of the left side, the head turns to the left by a spasmodic contraction of the right sternocleidomastoid muscle, and in the same way the tongue is apt to be forced over toward the left and bitten on the left side, indicating that the right lingual muscle is in a state of convulsion.

DR. PAUL C. BUCY, Chicago: The work on the cerebral cortex being done in the authors' laboratory is constantly clarifying clinical problems. There is one that has not been mentioned to which I wish to draw attention: the flaccid hemiplegias of cortical origin. Such a paralysis is usually associated with sensory changes and atrophy. The lesions that give rise to these hemiplegias are in the region of the rolandic fissure, involving the postcentral gyrus and area 4 but sparing area 6, the premotor area. The atrophy that occurs is probably not the result of "trophic" disturbance but rather an atrophy of disuse: disuse not only because of the absence of voluntary activity but because of the absence of reflex activity as well, practically no spasticity being present, as area 6 is still intact. In connection with the point Dr. Ayer brought up, it is common experience that in hemiplegia the lower extremity usually shows marked recovery, whereas the arm remains more completely paralyzed. This recovery has commonly been explained as due to the subsidence of edema and local vascular change about the more permanent area of damage in the internal capsule. And although this may play a minor rôle it does not

explain why the leg always recovers considerably whereas the arm recovers but slightly if at all. It would seem rather that the recovery of the lower extremity is due to innervation from the ipsilateral cerebral hemisphere, in which the lower extremity is much more extensively represented than the upper.

DR. HENRY R. VIETS, Boston: I should like to add a word in regard to this work on the premotor areas and its clinical application. Dr. Kennard, Dr. Fulton and I were able to work out, in one patient, a syndrome, which was referred to by Dr. Eckel. In that paper (*Brain* **57**:69 [March] 1934) we described the syndrome of the premotor cortex in man. Many neurologists thought we were going pretty far in describing a syndrome based on one case. As a matter of fact, the physiologic experimental work and investigation of the literature and one or two other cases that we have seen seemed to build up a group of symptoms we could justifiably call a syndrome. That syndrome consisted of the loss of or the diminution of skilled movements, spasticity, vasomotor changes and forced grasping. Even the order in which I have given them is of some significance. The patient we studied most carefully happened, fortunately, to have both a vocation and an avocation, which was of great help to us. His position was that of a shoe salesman, and his avocation was that of playing the piano. He noticed first difficulty in tying shoe laces. Loss of that skilled movement long preceded any other symptom. Finally there was difficulty in playing the piano, which of course is a very skilled movement. Then the syndrome proceeded through spasticity, followed, to be sure, by motor symptoms of the convulsive type, with vasomotor changes and very marked forced grasping in one hand. A removable tumor was found at operation, and since that time (it is now nearly a year) these symptoms have gradually decreased in the opposite order. He began to lose his forced grasping fairly early, then the vasomotor changes disappeared, and finally the spasticity, and now the patient reports that his only difficulty is in using his left hand to play the piano. That, of course, was a very enlightening case and seemed to justify our speaking of the premotor syndrome in man.

DR. J. F. FULTON, New Haven, Conn.: I agree with Dr. Wechsler that flaccidity of cortical origin is probably due to the unopposed action of the premotor area and that the predominant action of the premotor area on the lower center is one of inhibition. When therefore this area is removed, the reflexes that underlie the spastic state are released and the manifestations of decerebrate rigidity and the reflex changes associated with it develop. Dr. Ayer's question has been answered in part by Dr. Bucy, but it raises a more fundamental problem of whether there is a predominance of representation in the premotor area. We have no experimental evidence as yet bearing on the point, but I think it highly probable that the superior part of the premotor area has more to do with the lower extremity than the inferior part, which, presumably, being opposite the hand area, is predominantly associated with the more highly developed integrations of the upper extremity. Dr. Freeman has raised the question of Mayer's reflex. We purposely omitted Mayer's reflex from the table because we were not quite sure about it. It is probably a premotor reflex, but the data available do not permit us to say this with certainty for the experimental animal. The clutch reflex, hyperflexion of the toes, which is very similar to forced grasping as seen in the hand, is clearly a premotor phenomenon. We frequently see hyperflexion of the toes in response to plantar stimulation after removal of the premotor area, which is almost certainly the same phenomenon Dr. Freeman has referred to. The stimulus for this work has been throughout a clinical stimulus, and discussions such as we have had provide a great incentive to carry the work forward.

Coronary Thrombosis.—It is recognized that the proximal inch of the left coronary artery and its descending branch is the favorite region of localization of coronary atherosclerosis in its most extreme form. This is the standard site of coronary thrombosis.—Leary, Timothy: Experimental Atherosclerosis in the Rabbit Compared with Human (Coronary) Atherosclerosis, *Arch. Path.* **17**:453 (April) 1934.

THE ADVANTAGES OF PARALDEHYDE AS A BASIC AMNESIC AGENT IN OBSTETRICS

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Analgesia and amnesia are worthy objectives in obstetrics, provided the agents used are safe and do not lead to uterine inertia and unwarranted interference, with resulting increase in maternal and fetal morbidity and mortality. Analgesia has been attained with a fair degree of success by the use of morphine, nitrous oxide, ethylene and ether or chloroform, each agent being used at the time most appropriate for it during labor. Amnesia is of more recent interest and development. That it is a worth while objective admits of no argument.

The average patient will not openly confess the apprehension with which she approaches labor, and the average physician does not appreciate the shock sustained by the nervous system. If a suitable amnesic agent or combination of agents can be found which will properly satisfy the strict requirements pertaining to labor, analgesia need not be perfect as long as the patient retains no memory of her suffering, for to her the labor has been painless.

Numerous amnesic agents and methods have been proposed and used in recent years, but the continued search for new methods indicates that such fundamental objections as tendency to uterine inertia, undue restlessness and excitement, interference with fetal respiration at birth, technical difficulties or possible harm to mother or baby, have interfered with widespread adoption of any one method. As a rule, any method of amnesia increases the need for assistance to terminate the second stage of labor, owing to the fact that the reflex, involuntary expulsive efforts alone are not as efficient as when reenforced by voluntary efforts. Any attempt to encourage voluntary efforts may so arouse the patient that amnesia will not be complete.

REQUIREMENTS OF SATISFACTORY ANALGESIA AND AMNESIA IN OBSTETRICS

There are certain fundamental requirements to which any proposed method of amnesia and analgesia should conform. To satisfy these requirements, it is often best to use two or more agents in combination whereby certain advantages may be enhanced and certain objectionable effects may be minimized.

Concerning the mother, there should be safety, a minimum of uterine inertia, preservation of reflex expulsive efforts, a minimum of excitement and no tendency to postpartum hemorrhage.

Concerning the baby, there should be safety and a minimum of interference with the establishment of respiration at birth.

Concerning the method, it should be simple, adapted to home as well as to hospital confinements, rapid in action, prolonged in effect and possess a wide margin of safety between the therapeutic and the toxic dose.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Fifth Annual Session of the American Medical Association, June 14, 1934.

INTRODUCTION OF PARALDEHYDE IN OBSTETRICS

It occurred to one of us (E. D. C.) in 1930 that the well known properties of paraldehyde, namely, a wide margin of safety, rapid absorption, rapid action and prolonged hypnotic effect with rarely any excitement or effect on the medullary centers, should make it a very desirable amnesic agent in obstetrics. At that time a review of the literature showed no reference to its use in obstetrics. No steps were taken to test its merits until the summer of 1933. At that time another review of the literature revealed a preliminary report by Rosenfield and Davidoff [1] based on the use of paraldehyde combined with pentobarbital sodium or sodium amytal in fifty cases. They reported complete amnesia in forty-seven cases and partial amnesia in three cases. There were no failures. There was no prolongation of labor, but this may have been due to the fact that delivery was accomplished by the prophylactic application of low forceps in forty-four cases, by midforceps in five cases and by internal podalic version in one case. To these authors should be given the credit for introducing paraldehyde as an amnesic agent in obstetrics.

In our own series of 100 consecutive cases we used paraldehyde as the basic amnesic agent in synergistic combination with sodium amytal and depended on nitrous oxide and ether for analgesia and anesthesia during the latter part of labor and at delivery. In nulliparas in whom the condition of the cervix and the character of the pains suggested a probable slow labor, morphine and scopolamine were used in addition to sodium amytal early in the first stage. All the women in the series were private patients and under personal supervision throughout labor.

We purposely avoided terminating labor with forceps, except in cases in which a real indication existed, such as undue prolongation of the second stage or the presence of some emergency. It would seem that a high incidence of forceps delivery would not furnish as thorough a test of the amnesic effect of the method as a natural termination of labor with the help of the patient's expulsive efforts. Rosenfield and Davidoff preferred to use 7½ grains (0.5 Gm.) of pentobarbital as a preliminary to the administration of from 4 to 6 drachms (15 to 22.5 cc.) of paraldehyde. In our own series we used 6 grains (0.4 Gm.) of sodium amytal on account of a more prolonged effect and a lessened possibility of uterine inertia, and followed this with from 6 to 8 drachms (22.5 to 30 cc.) of paraldehyde.

FACTORS DETERMINING TIME TO BEGIN TREATMENT

It is of the greatest importance in this as well as in any other method of obstetric amnesia and analgesia that each case be individualized on the basis of (1) parity, (2) degree of effacement and dilatation of the cervix, (3) frequency and duration of the pains and (4) whether or not the membranes are ruptured, these factors being listed according to their importance.

If the patient is a multipara, delivery will probably occur within the average duration of the effect of the injection, which is usually from five to seven hours, whereas if she is a nullipara, the injection will have to be delayed until more progress has been made or else repeated before labor has terminated.

The degree of effacement, dilatation and softening of the cervix is more to be relied on in estimating the probable duration of labor than the pains.

Since many labors are characterized by considerable inertia in the first stage, it is important to withhold all medication until the pains are less than five minutes apart and of at least forty-five seconds duration. To begin any method of relief with pains occurring at intervals of from five to ten minutes is to invite inertia, prolongation of labor, discouragement of the patient and unwarranted interference. Furthermore, the patient, particularly the nullipara, will better appreciate what has been done for her if she is permitted to experience strong pains and make definite progress for a short period before being made oblivious to the most difficult and painful part of the labor.

Rupture of the membranes tends to insure better pains and progress, but if done artificially, it should usually be postponed until the cervix is at least one half dilated and the head is well fixed in the pelvis.

Hence, any one or more of the factors of multiparity, thin soft cervix, frequent severe pains or ruptured membranes lessens the possibility of inertia developing after the treatment has been given.

Since the condition of the cervix is so important from the standpoint of when and how to administer the treatment, it will be found of great advantage to be able to follow the progress of labor accurately by rectal rather than by vaginal examinations. Rectal examinations may be made more often, conveniently and safely, and if one will follow the sequence of rectal, then vaginal, and, finally, rectal with each examination in labor, the technic will not be found difficult to acquire and it will seldom be necessary to make vaginal examinations.

In any case, if rectal or vaginal examination shows that the cervix still has some length or that the cervical rim is still thick, not fully softened and not dilated more than from 1 to 2 cm., it is best to withhold all medication, even if the pains occur at less than five minute intervals. This will not deprive the patient of any necessary relief at this stage of labor and will avoid aggravating a possible uterine inertia, which has not yet become manifest.

THE TECHNIC OF TREATMENT AND MANAGEMENT IN NULLIPARAS

When the pains are less than five minutes apart and last for from three-fourths to one minute, and the cervix is thin and dilated from 2 to 3 cm., 3 grains (0.2 Gm.) of sodium amytal may be given. If, within from one-half to one hour, satisfactory progress continues and cervical dilatation has increased to from 4 to 5 cm., the second dose of 3 grains of sodium amytal may be given, to be followed within one-half hour by the rectal injection of paraldehyde.

If, however, there is very little increase in cervical dilatation after the first dose of sodium amytal, the second dose should be withheld, and if progress continues to be slow but painful one-sixth grain (0.01 Gm.) of morphine and 1/300 grain (0.0002 Gm.) of scopolamine in 1 cc. of 50 per cent solution of magnesium sulphate may be administered, which will usually give ample relief for several hours. Cervical dilatation will then probably be sufficient to give the second dose of 3 grains of sodium amytal, followed by the rectal injection of paraldehyde one-half hour later.

In other words, in nulliparas, we prefer to obtain cervical dilatation of from 5 to 6 cm. with the preliminary dose of 6 grains of sodium amytal and the occasional use of one-sixth grain (0.01 Gm.) morphine and 1/300 grain (0.2 mg.) scopolamine before giving the

1. Rosenfield, H. H., and Davidoff, R. B.: A New Procedure for Obstetrical Analgesia, New England J. Med. **207**: 366 (Aug. 25) 1932.

rectal injection of paraldehyde. Certain patients will normally show more or less uterine inertia, with no medication whatever, and to administer the complete treatment too early in labor may result in the patient going to sleep, making little or no progress and waking up, later on, disappointed to find that she is still undelivered. The hypodermic injection of morphine and scopolamine should not be given if delivery is anticipated within several hours on account of the depressing effect on the infant's respiration at birth; hence its use is practically limited to nulliparas. The preliminary and complete dose of 6 grains of sodium amytal seems to be more essential than the morphine and scopolamine in securing complete amnesia with paraldehyde.

From one-half to one hour after the full dose of sodium amytal has been given, the rectal injection of paraldehyde should be given, provided there is no evidence of uterine inertia. The bladder should be emptied at this time. An enema at the onset of labor is advisable in all cases to insure thorough emptying of the lower bowel and to facilitate retention and absorption of the paraldehyde.

From 6 to 8 drachms of paraldehyde is mixed with an equal amount of olive oil, a thorough mixture being obtained by alternately drawing up and expelling the solution with a 50 cc. syringe, fitted with an ordinary adapter to facilitate attachment of the rectal tube. Sufficient air is drawn into the syringe in addition to the mixture to expel the solution, which would otherwise remain in the rectal tube. The tube should be sufficiently soft and flexible to prevent injury to the bowel wall. The larger dose (8 drachms) is preferable, since there may be some waste during injection or some expulsion after injection. Sufficient solution should be expelled from the syringe almost to fill the tube, but it should not be allowed to escape.

The injection should be made just after or between pains, never during a pain, with the patient lying in the left lateral or dorsal position, preferably the latter. The index finger should be inserted with the tube, to guide it under the baby's head somewhat beyond the full length of the finger. Retention and absorption are not as satisfactory if the injection is made too low in the rectum. Rotation of the tube will remove any kink or obstruction. The injection is made within half a minute and the tube is quickly withdrawn. Gauze is placed against the anus at once to prevent expulsion of the solution, the patient being turned onto her left side and cautioned to avoid straining efforts. Constant pressure against the anus is maintained for from twenty to thirty minutes, at the end of which period the patient is usually asleep and has ceased attempts to expel the solution. She may then be turned onto her back and the pressure discontinued.

It is best to refrain from rectal examination for at least one hour after the injection in order to avoid the risk of expulsion of some of the solution during the examination, progress being judged by abdominal examination, expulsive efforts and inspection of the perineum.

THE TECHNIC OF TREATMENT AND MANAGEMENT IN MULTIPARAS

Whereas in nulliparas the main problem is to withhold the rectal injection until there is sufficient progress and no evidence of primary inertia, in multiparas the main problem is to see the patient in the home or hospital early enough to give an enema and obtain the desired effect from sodium amytal and paraldehyde before labor has progressed too far. For this reason it is important to instruct the multipara in the latter part of pregnancy to report at once any show of blood, discharge of water or onset of regular pains occurring at intervals of not less than ten minutes.

If the cervix is not fully effaced or softened and not dilated more than from 1 to 2 cm., it is best to delay treatment until it is evident that there will be no inertia. When the cervix becomes thin and is dilated from 2 to 3 cm., 6 grains of sodium amytal may be given at once if the pains are severe, but it is given in two doses of 3 grains each at an interval of from one-half to one hour if the pains are less severe and the progress is slow. If quick action is desired, the powder may be given without the capsules. The most desirable time to administer the rectal injection of paraldehyde in the multipara is when the cervix is fairly thin and dilated from 3 to 4 cm. If the membranes have already ruptured, the treatment may be given earlier, as there is less chance of uterine inertia. If the cervix is fully dilated and the head is low in the pelvis when the patient is first seen, delivery will usually occur too soon for the injection to take effect. However, if the cervix is from one-half to two-thirds dilated, especially if the membranes are unruptured, the full dose (6 grains) of sodium amytal may be given at once, and if the patient is delivered before the rectal injection can be given or take effect, no harm will have been done.

The technic of the injection and the subsequent management is the same as that given for nulliparas. Nitrous oxide will often suffice for delivery; otherwise light ether anesthesia, depending on the degree of relaxation of the perineum, may be used. If precipitate delivery is threatened before the patient can be moved to the delivery room, ether may be given to retard progress until the patient can be moved and properly prepared. Solution of pituitary may then be given to offset the effect of the ether.

EFFECT OF THE INJECTION OF PARALDEHYDE

The first effect of the injection of paraldehyde may be a slight burning sensation and a desire to expel the solution. From five to ten minutes after the injection hiccups may be noticed. From ten to fifteen minutes after the injection the patient begins to doze lightly between pains and the odor of paraldehyde may be detected on her breath. From twenty to thirty minutes after the injection she is usually sound asleep between pains and may have snoring respiration. During the pains she moves her arms and legs sluggishly and may turn from side to side but makes little or no sound. The eyes remain closed or occasionally open momentarily without any apparent focusing of attention. At times she may make some fairly rational remark concerning the pain or her surroundings, but as a rule her words are unintelligible or concern events that have no relation to labor, thus showing a definite disorientation. She usually seeks a comfortable position on either side, which at times seems to be responsible for slight inertia, but pains usually continue with the same frequency and duration, especially if she can be kept on her back. The pulse, respiration and blood pressure show no appreciable change. While nitrous oxide may be found helpful, it is not indispensable and the patient may continue without it until ether can be given during crowning. The baby cries promptly at birth and shows no change in its behavior after birth.

AIDS IN OBTAINING COMPLETE AMNESIA

Since complete amnesia is desirable, every effort is made to avoid stimulating or arousing the patient. From the time the rectal injection is given and the patient turned on the left side, she is shielded from bright light; the attendants are instructed to converse in low tones or whisper and all unnecessary noise is avoided. Members of the family or friends are cautioned against arousing the patient and they are usually content to remain outside the room. If the patient's position is changed it is done as gently as possible. It has been found helpful to cover the patient's eyes with gauze held in place by adhesive to lessen the chance of her comprehending the situation if momentarily awakened. This is particularly important before moving her to the delivery room. It is less disturbing to move her bed to the delivery room and lift her onto the delivery table. These precautions are carried out to insure better success with the patient who may be less susceptible to the drug and who might otherwise have so-called islands of memory throughout labor. Immediately after delivery an intramuscular injection of morphine and scopolamine may be given if it is considered necessary to insure a period of several hours' sleep on return to the room. However, there will usually remain sufficient effect from the rectal injection to make this unnecessary. The family should be advised not to disturb the patient until she awakes.

AIDS IN OVERCOMING POSSIBLE INERTIA

Inertia developing during labor is not always due to the amnesic and analgesic effect of the treatment, as it is occasionally observed during the course of normal untreated cases. If it is present during the first stage of labor, artificial rupture of the membranes may be performed any time after the cervix is half dilated and will usually stimulate progress. Solution of pituitary may be dropped from a syringe into the patient's nose, to flow back over the mucous membrane. Definite response to the instillation is usually seen within ten minutes, and the possibility of a strong reaction is much more remote than with the subcutaneous injection. If there is undue prolongation of the second stage, from 2 to 3 minims of solution of pituitary may be given subcutaneously, provided there is no contraindication such as persistently slow fetal heart, abnormal position of the head, or contraction of the pelvic outlet, and also provided the patient is prepared for delivery. Episiotomy under local anesthesia may be sufficient if delay seems to be due to a rigid perineum. Failing in this, a low forceps delivery may be performed.

MANAGEMENT DURING AND AFTER DELIVERY

The nullipara is not moved to the delivery room until a slight degree of crowning is apparent, not only during but between the pains. The multipara may be moved when the head begins to cause bulging. To avoid undue disturbance, the bed may be moved into the delivery room and the patient lifted onto the delivery table. She rarely remembers being transferred to or from the delivery room and does not arouse during preparations for delivery. It is to be noted that these patients require much less ether than usual and show very little resistance to it. There is no tendency to postpartum hemorrhage. On its return to the room, the bed is placed against the wall and chairs are placed alongside, which precaution is apparently unnecessary as the patient sleeps very quietly for several hours.

Comparison of Methods

Methods	Amnesia: Degree: Complete, per Cent	Amnesia: Degree: Partial, per Cent	Amnesia: Degree: Failure, per Cent	Amnesia: Before Delivery: Nulliparas, Hours	Amnesia: Before Delivery: Multiparas, Hours	Amnesia: After Delivery: Nulliparas, Hours	Amnesia: After Delivery: Multiparas, Hours	Total Duration of Labor: Nulliparas, Hours	Total Duration of Labor: Multiparas, Hours	Undesirable Effects: Excitement, per Cent	Undesirable Effects: Restlessness, per Cent	Undesirable Effects: Uterine Inertia, per Cent	Undesirable Effects: Fetal Apnea, per Cent	Undesirable Effects: Postpartal Hemorrhage, per Cent	Method of Delivery: Spontaneous, per Cent	Method of Delivery: Pituitary, per Cent	Method of Delivery: Forceps: Low, per Cent	Method of Delivery: Forceps: Mid, per Cent	Deaths: Fetal, per Cent	Deaths: Maternal, per Cent
(*a*) Authors' 100 cases, former routine	..	..	..	..	..	..	..	16½	8¾	..	..	13	17	6	79	5	10	8	1	0
(*b*) Authors' 100 cases, paraldehyde technic	82	16	2	5	3	5	5½	16¼	9½	2	4	8	9	3	81	14	9	7	0	0
(*c*) Rosenfield and Davidoff 50 cases, paraldehyde technic	94	6	0	9½	4½	8	8	....	....	..	8	..	10	..	0	..	88	10	2	0
(*d*) Irving et al., 100 cases, pentobarbital and scopolamine technic	86	14	0	7	4	..	..	14½	9½	..	..	..	37	3	70	..	—30—		2	0

(*a*) This group includes sodium amytal (3 to 6 grains) morphine (one-sixth grain) and scopolamine (1/300 grain) in 1 cc. of 50 pe cent solution of magnesium sulphate when indicated, nitrous oxide and ether. This group includes forty-three nulliparas and fifty-seven multiparas.
(*b*) This group includes sodium amytal (3 to 6 grains), paraldehyde (6 to 8 drachms), nitrous oxide and ether; morphine and scopolamine when indicated. A group of forty-three nulliparas and fifty-seven multiparas.
(*c*) This includes pentobarbital sodium (7½ grains) or sodium amytal (6 grains), paraldehyde (4 to 6 drachms), nitrous oxide and ether.
(*d*) This includes pentobarbital (4½ to 6 grains), scopolamine (1/100 to 1/150 grains) to be repeated as necessary, nitrous oxide and ether in the expulsive stage.

COMPARISON OF METHODS

Prior to the use of paraldehyde our method of relief was through the use of from 3 to 6 grains of sodium amytal early in labor, followed by nitrous oxide and ether. In nulliparas, morphine and scopolamine were often given intramuscularly following the sodium amytal.

It seemed best, therefore, to compare the results obtained in 100 consecutive cases treated according to the outlined method with those obtained in an equal number of cases relieved by the addition of paraldehyde to these measures. In both series the cases were taken consecutively, with the exception of instances in which some complication, increasing the risk to the mother or baby, made it unfair to include the case.

The accompanying table presents a comparison of the two series, the series reported by Rosenfield and

Davidoff and the series in which the pentobarbital-scopolamine method was used [2] (apparently the method of choice with many obstetricians) in regard to the most important considerations involved in analgesia and amnesia, and enables one to estimate the advantages or disadvantages of paraldehyde.

Comparing methods *a* and *b* in the table, it is seen that the addition of paraldehyde to the measures of relief formerly used resulted in no increase in the length of labor or the frequency of postpartum hemorrhage. There was a decrease in the frequency of uterine inertia and fetal apnea, but this is possibly due to the fact that morphine and scopolamine were used less frequently. There was a slight increase in the number of spontaneous deliveries and a slight decrease in the use of forceps. Solution of pituitary was used approxmately three times as often, usually to hasten crowning and also to avoid the necessity of urging the patient to bear down. There was no maternal or fetal mortality. In two cases, intra-uterine fetal death had occurred before labor began, and the babies were born in a macerated condition. Since the paraldehyde given during labor had nothing to do with these stillbirths, they were properly disregarded.

Comparing methods *b* and *c*, it is seen that Rosenfield and Davidoff obtained 94 per cent complete amnesia and 6 per cent partial amnesia and had no failures, whereas we had 82 per cent complete amnesia, 16 per cent partial amnesia and 2 per cent failures. Under partial amnesia we include those patients who had one or more so-called islands of memory, such as remembering transfer to or from the delivery room, induction of anesthesia with ether or gas, noticing bright lights in the delivery room and restraint of the hands. There was no remembrance of pain. Therefore, these cases of partial amnesia, in which the memory of the most difficult part of labor is limited to one or more events of so little consequence, should properly be considered successful. Analysis indicates that such factors as prolonged labor, wherein the labor outlasts the effect of the drugs (from five to seven hours), failure to administer a small second injection (from 2 to 3 drachms), expulsion of some of the injection, too rapid progress after the injection, or inability to coordinate the administration of the drugs were responsible for failure to obtain complete amnesia. Had we resorted to delivery by routine forceps in these cases, as practiced by Rosenfield and Davidoff, many of the patients would have had complete amnesia through a shortening of the labor and a lessened degree of stimulation.

These factors that often interfere with obtaining complete amnesia may be controlled as one becomes more familiar with the technic and management. This is shown by the fact that the majority of cases of partial amnesia occurred in the first fifty cases in our series, whereas in the last fifty cases, forty-seven, or 94 per cent, showed complete amnesia.

Two cases in our series were designated as failures, not in the sense that they did not derive great relief from the treatment but only because the usual amnesic effect was not obtained. These patients were probably more or less immune to the drugs used, an idiosyncrasy that may be found in the use of any drug. It is therefore possible to obtain complete amnesia in from 90 to 95 per cent of all cases and to afford great relief to the small number who fail to obtain amnesia.

Since Rosenfield and Davidoff used forceps as a routine, it enabled them to administer the treatment earlier in labor and to disregard the possibility of inertia, thereby lengthening the period of amnesia before delivery. This probably accounts for the longer duration of amnesia before delivery, although it is difficult to account for the longer duration of amnesia after delivery in their series, especially since pentobarbital is supposed to have less prolonged effect.

In our series, a patient's behavior was considered to be normal if she slept quietly between pains, made no outcry and merely turned from side to side or moved sluggishly during pains. It is admitted that these patients tend to disarrange sterile drapings and get out of position on the delivery table to a greater extent than if they were awake, but they are not at all difficult to control. Patients showing restlessness did not attempt to sit up or make any outcry but showed more constant motion, not only during but between pains. Patients showing excitement sat up in bed at times, made considerable outcries and were in a state of constant activity. According to this standard, only 2 per cent of the patients showed excitement and 4 per cent showed restlessness in our series. Rosenfield and Davidoff reported restlessness in 8 per cent of their patients. We believe that restlessness is a manifestation of barbiturate and not of paraldehyde action and is increased in some patients of a nervous temperament. It is not present to a troublesome degree in this method of amnesia.

Comparing methods *b* and *d*, it is seen that the pentobarbital-scopolamine method results in a slightly higher frequency and a slightly longer duration of amnesia before delivery, with some apparent shortening of labor, although the latter may be partly due to the more frequent use of forceps. There is a much greater frequency of fetal apnea at birth when scopolamine is used, which may be of some concern to the attendant and family, although the low fetal mortality indicates that apnea is not, of itself, a serious symptom.

Although Irving [3] states that any method of amnesia in labor should be strictly a hospital and not a home procedure, we see no reason why the less favored mothers who must continue to be confined at home should not have the relief offered by this method of amnesia. The physician will require no more assistance than is usually freely available to him in the average home confinements; the apparatus for administration is very simple; the drugs are inexpensive and readily obtainable; labor is not prolonged and the frequency of forceps delivery is not increased; there is no risk to the mother or baby, and since complete amnesia can be obtained in from 90 to 95 per cent of all cases, we believe that this method more nearly approaches the ideal method of amnesia in labor than any other in use at the present time.

CONCLUSIONS

1. Analgesia and amnesia are desirable objectives in labor provided they are compatible with physiologic labor.

2. Paraldehyde as a basic amnesic agent in combination with sodium amytal or pentobarbital approaches the ideal in satisfying the fundamental requirements pertaining to labor.

2. Quigley, J. P.; Barlow, O. W., and Himmelsbach, C. K.: Correlation of Visceral and Somatic Activity Following Administration of Hypnotics (A) Barbital Compounds, and (B) Tribrom-Ethanol (Avertin-Crystals and Fluid), J. Pharmacol. & Exper. Therap. **50**: 425-439 (April) 1934.

3. Irving, F. C.; Berman, Saul, and Nelson, H. B.: Barbiturates and Other Hypnotics in Labor, Surg., Gynec. & Obst. **58**: 1 (Jan.) 1934.

3. Complete amnesia may be obtained in from 90 to 95 per cent of all cases with no increase in uterine inertia, duration of labor, forceps deliveries, fetal apnea, postpartum hemorrhage, or fetal or maternal morbidity or mortality, and with a minimum of restlessness.

4. There are no contraindications to its use in home confinements.

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ABSTRACT OF DISCUSSION

DR. HAROLD H. ROSENFIELD, Boston: I advocate attempting to secure complete relief of pain throughout labor and not merely of the last half, because my experiences seemed to prove that this can be achieved without prolongation of labor and without any deleterious effects to either mother or baby. It is because I believe in complete relief that my larger dosage and earlier administration are somewhat at variance with the procedure advocated by Drs. Colvin and Bartholomew. I start medication as soon as labor is definitely established. The index for this is the regularity and character of uterine contractions, regardless of the height of the presenting part or the dilatation of the cervix. I frequently start medication with a floating presenting part and a cervix that is not taken up. I have found that once labor is definitely established its progress is not interfered with by pentobarbital sodium. The procedure is as follows: At the outset of definite labor, 7½ grains (0.5 Gm.) of pentobarbital sodium is given in divided doses. This is followed promptly by 6 drachms (22.5 cc.) of paraldehyde in oil by rectum. This medication is usually sufficient to carry a patient through the average type of labor for six or seven hours. If patients show evidence of conscious suffering before this time, rectal examination is made to determine whether labor can be carried to completion with gas-oxygen inhalations. If the examination reveals that the patient still has several hours of labor, from 1½ to 3 grains (0.1 to 0.2 Gm.) of pentobarbital sodium is given by mouth or by rectum. If this added dose of pentobarbital sodium fails to quiet the patient, from 2 to 4 drachms (7.5 to 15 cc.) of paraldehyde may be repeated by rectum. This will usually carry the average patient through a twelve or fourteen hour labor. Should labor be further prolonged, small amounts of pentobarbital sodium with or without paraldehyde may be repeated as necessary until the time arrives when she can be carried along to completion of labor with small amounts of gas-oxygen inhalations. Failure to repeat medication when necessary will result in increased restlessness and diminished amnesia. With this procedure I have found that there is no appreciable interference with the secondary forces of labor, as the patients, though asleep, bear down forcibly and usually bring the presenting part to the perineal floor. When the vertex reaches the perineal floor and partially crowns, I complete the delivery by the use of perineal forceps and episiotomy, when indicated. The forceps in these instances is used to guide the head more carefully over the perineum and thereby conserve the patient's energy and pelvic floor.

DR. H. F. KANE, Washington, D. C.: I have used paraldehyde as the basic drug for securing amnesia and analgesia in labor in 250 cases. The safety factor for both mother and baby is of great importance. I have seen no untoward results. When the patient first complains of pain I begin to administer paraldehyde. I use no barbiturates but frequently give morphine, although many cases have been carried through labor with paraldehyde alone. If restlessness occurs, I occasionally administer one-fourth grain (0.016 Gm.) of morphine. I administer 1 cc. of paraldehyde for each 10 pounds (4.5 Kg.) of body weight of the mother. But that isn't enough. I add 2 or 3 cc., depending on the size of the patient. It is a little unscientific, but I have not yet determined just how much should be added. I have repeated that dose as frequently as every hour for three doses. Usually the dose given will cause the patient to sleep three or three and one-half hours. Then she begins to be restless and at the first sign of restlessness the paraldehyde is repeated. In all except cases of very rapid labor, amnesia is complete. It seems to me that paraldehyde is an agent that can be given with safety. It causes the least excitement of all the drugs I have used and is easy of administration. I administer the drug in 4 cc. of physiologic solution of sodium chloride instead of in oil.

DR. R. A. BARTHOLOMEW, Atlanta, Ga.: Dr. Rosenfield's figures indicate clearly what can be accomplished with hospitalized cases, both in shortening the duration of labor and in obtaining practically complete amnesia throughout the entire duration of labor. However, an average duration of labor of eight to nine hours in nulliparas indicates that the second stage of labor has been very much shortened or practically eliminated by the use of forceps. Our object in avoiding the routine use of forceps was to demonstrate to those in general practice that this method is applicable to deliveries in the home and will not increase the need for forceps delivery. We would advise those trying this method for the first time to administer it first to multiparas, since the duration of labor in this class of patients comes well within the duration of amnesia obtained with paraldehyde. It is also important to develop one's ability to judge the progress of labor by rectal rather than by vaginal examinations, since the former may be made more conveniently, quickly and without risk. From the standpoint of expense, the cost of the drugs used in this method is extremely low. Furthermore, the wide margin of safety is an important advantage. This was impressed on us recently by the accidental administration of 8 ounces (236 cc.) of paraldehyde instead of 8 drachms (30 cc.) to a male patient in the genito-urinary department of Grady Hospital. When he was sent to the operating room over one hour later he was observed to show a much greater relaxation than usual and the error was discovered. The oil and paraldehyde were washed out as thoroughly as possible but not until he had retained the dose about one and a half hours. He slept nineteen hours and made a good recovery. Hence we may say that even an excessive dose of paraldehyde seems to have no harmful effect.

THE BEARING OF CERTAIN PHYSIOLOGIC FACTS ON GASTRO-INTESTINAL SURGERY

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William Beaumont[1] in 1833 made the first definite note on peristalsis of the stomach. His observations and experiments on Alexis St. Martin began in 1825. Beaumont had been treating this patient, who had a gastric fistula following a wound from a shotgun, for nearly three years before it occurred to him to use St. Martin as a laboratory animal and observe what occurred in the stomach during digestion. In the eight years between 1825 and 1833 he made 238 experiments. Among other things he noted that the time required for disposal by the stomach of a moderate meal is from three to three and a half hours. He showed that the agent of digestion in the stomach is the gastric juice, which acts as a solvent and contains "free muriatic acid and some other chemical principle." The other chemical principle was demonstrated a few years later by Eberle to be a specific gastric ferment called by Schwan "pepsin." He stated that gastric juice checks the process of putrefaction and that motions of the stomach produce a constant churning of its contents in two directions, transversely and longitudinally.

The introduction of roentgen rays aided greatly in the study of peristalsis. Cannon[2] and his associates made careful roentgenologic observations of the peristalsis of

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1. Beaumont, William: Experiments and Observations on the Gastric Juice and the Physiology of Digestion, Plattsburgh, 1833.

2. Cannon, W. B.: Peristalsis, Segmentation and the Myenteric Reflex, Am. J. Physiol. **30**: 114-128, 1912.

the stomach and bowel. It was noted that peristalsis began about the middle of the body of the stomach and proceeded toward the pylorus. To Cannon's observations many roentgenologists and physiologists have added interesting data. Gregory Cole [3] of New York has described the cycles of gastric peristalsis. Alvarez,[4] whose work was confirmed by Klein [5] and others, has shown that active gastric peristalsis, which as fluoroscopically observed begins about the middle of the body of the stomach, really starts as ripples along the lesser curvature near the cardiac orifice and proceeds with increasing vigor until the middle of the body of the stomach is reached, where the waves can for the first time be observed roentgenologically. To the left of this point the contractions are largely tonic, so that the cardiac end of the stomach shoves food into the actively churning right portion of the stomach by continuous mild pressure, much as an elastic hopper would do.

The larger portion of the stomach is physiologically "silent" as to symptoms. All the greater curvature except a short portion near the pyloric end, where a lesion would produce obstruction, and much of both walls of the stomach, particularly in the cardiac portion, give no symptom of a lesion unless there is bleeding or perforation, or unless the growth is large enough to produce mechanical obstruction. In the physiologically active part of the stomach along the lesser curvature or at the pyloric end where mechanical obstruction may readily occur, lesions cause derangement of peristalsis and produce symptoms such as pain, regurgitation, waterbrash, heartburn, nausea or vomiting. About 80 per cent of all gastric symptoms are from trouble with the motor apparatus, which includes not only the interference along the lesser curvature but mechanical obstruction at the narrow pyloric end.

REGURGITATION OF DUODENAL CONTENTS

Within recent years it has been demonstrated that at the end of normal gastric digestion, when the stomach has emptied its contents and strongly acid gastric juice has accumulated in the stomach, the pylorus opens and a reflux of the duodenal contents occurs. This reduces the acidity of the gastric juice.

A prolonged pyloric spasm or a mechanical obstruction, which prevents regurgitation of the alkaline duodenal contents, predisposes toward an increased tone of the stomach by retaining highly acid gastric contents and thus favors ulcer formation. Types of food that tend to irritate the gastric mucosa, reflex stimulation from some lesion in the abdomen, nervous impulses from worry, an imbalance between the vagus and the sympathetic system, particularly when the stimulating impulses dominate, all promote pylorospasm, increased muscle tone of the stomach, increased acidity of the gastric juice, and increased vascularity. The treatment of the patient for this condition is often more important than the treatment of the local gastric symptoms. When, however, there is an organic lesion that will not permit the reflux of the alkaline duodenal contents into the stomach, some surgical procedure may be indicated.

Before the establishment of the physiologic fact that duodenal contents normally regurgitate at the end of the digestion of a meal, the presence of bile in the stomach was looked on with disfavor. The chief alkaline constituent of the duodenal contents is not the bile, whose color gives it prominence, but the strongly alkaline pancreatic juice, and the presence of duodenal contents in the stomach at the end of normal gastric digestion is probably a protective measure against the excessive acidity of the gastric juice that follows the emptying of food from the stomach, when the acid of the gastric juice has no such buffer as the food.

PYLOROPLASTY AND GASTRO-ENTEROSTOMY

In functional pylorospasm, medical measures are usually sufficient. If not, the operation of Walter Hughson [6]—resection of the gastric branches of the vagus nerves—may be indicated. If there is in the duodenum near the pylorus a well limited small peptic ulcer, without surrounding adhesions or inflammation, an ulcer which has resisted medical measures, a pyloroplasty usually gives excellent results. If the lesion is extensive, if adhesions are abundant, if there is much scar tissue, and particularly if there is duodenitis, pyloroplasty is contraindicated, and gastro-enterostomy under these conditions is a satisfactory procedure in the majority of cases.

It was formerly rather popular to decry gastro-enterostomy as an unphysiologic and therefore unjustified operation, and one of the chief objections was that it admitted bile and duodenal contents to the stomach. But the knowledge that this is a normal procedure in gastric digestion and secures the desirable reduction of the acid values of the gastric juice justifies gastro-enterostomy, for it seems to restore this physiologic function of regurgitation of the duodenal contents which has been prevented by pyloric obstruction.

Mann and his associates [7] have convincingly shown that in dogs the so-called surgical drainage of the duodenum almost always results in peptic ulcer. In this procedure the jejunum some distance below the duodenum is divided and the duodenum is severed at the pylorus and its end closed. The distal end of the jejunum is sutured to the pylorus and the proximal (oral) end is implanted into the small bowel lower down, thus depriving the portion of the jejunum attached to the stomach of the alkaline contents of the duodenum. These experiments show the fallacy of the Roux or Y gastro-enterostomy, which is practically surgical duodenal drainage and deprives the bowel attached to the stomach of the protective alkalinity of the duodenal contents. Entero-anastomosis between long loops of jejunum, as after anterior gastro-enterostomy or some types of partial gastrectomy, is for the same reason objectionable but doubtless diverts from the segment of bowel attached to the stomach only a portion of the alkaline duodenal contents instead of all of it, as in the Y technic.

CHOLECYSTOGASTROSTOMY FOR THE CURE OF PEPTIC ULCER

The advocacy of a cholecystogastrostomy for the cure of peptic ulcer seems to be founded on three physiologic fallacies, any one of which is fatal. It has been assumed that the union of the gallbladder to the stomach would provide a constant natural alkaline fluid, which

3. Cole, L. G.: The Complex Motor Phenomena of Various Types of Unobstructed Gastric Peristalsis, Arch. Roentg. Ray **16**: 242-247, 1911; Motor Phenomena of the Stomach, Pylorus and Cap Observed Roentgenographically, Am. J. Physiol. **42**: 618-619, 1917.

4. Alvarez, W. C.: The Mechanics of the Digestive Tract, ed. 2, New York, Paul B. Hoeber, Inc., 1928.

5. Klein, Eugene: (*a*) Gastric Motility: I. The Origin and Character of Gastric Peristalsis, Arch. Surg. **12**: 571-582 (Feb.) 1926; (*b*) II. The Conduction of the Gastric Peristaltic Wave, ibid. **12**: 583-590 (Feb.) 1926.

6. Hughson, Walter: Reflex Spasm of the Pylorus and Its Relation to Diseases of the Digestive Organs, Arch. Surg. **11**: 136-151 (July) 1925.

7. Mann, F. C., and Williamson, C. S.: The Experimental Production of Peptic Ulcer, Ann. Surg. **77**: 409-422 (April) 1923.

would tend to lower the gastric acidity and so promote the healing of the ulcer. The fallacies follow: 1. Bile has a very low alkaline value and is often neutral. The alkalinity of the duodenal contents resides chiefly in the pancreatic juice, which is highly alkaline, but pancreatic juice does not normally enter the gallbladder. The biliary coloring of the duodenal contents gives the superficial impression that bile is the most important constituent, when it is probably the least important. 2. If there is no obstruction to the common duct, the discharge of bile from a cholecystostomy is comparatively slight. Surgeons have noted that, after the inflammation has cleared up and if the common duct is open, but little bile comes from a cholecystostomy. It seems probable that but little bile would escape from a normal gallbladder connected with the stomach unless the common duct should be obstructed or ligated—a remedy worse than the disease. So even if the bile were strongly alkaline, which it is not, but little of it would be delivered into the stomach. 3. The third fallacy is that no account is taken of the effect of the gastric juice on the gallbladder. In cases in which there is obstruction of the common duct from cancer of the head of the pancreas, the acid values in the gastric juice are usually low and cholecystogastrostomy as a procedure to relieve jaundice in these cases doubtless has a definite place. But it must be recalled that in a peptic ulcer the acid values of the gastric juice are frequently quite high, and if bile goes through a cholecystogastrostomy into the stomach the acid gastric juice with its irritating effect on a mucosa unaccustomed to acid likewise goes into the gallbladder. It has also been shown experimentally that a cholecystogastrostomy is quite constantly followed by an ascending infection and an eventual hepatitis.

V-SHAPED AND MIDGASTRIC RESECTION

If a large V-shaped section of the stomach of a dog is removed with the base on the greater curvature and a small channel is left along the lesser curvature there is but little interference with gastric function. If, however, a V-shaped section is taken from the lesser curvature, the gastric motor function is upset.[5b] This should indicate that whenever possible in a local operation on the stomach the structures along the lesser curvature should be respected and preserved. Not only is a V-shaped resection of the lesser curvature of the stomach unsatisfactory as to restoration of function, but a midgastric resection usually gives bad functional results. There is a tendency to constriction and hourglass deformity, and the interruption of the impulses to the pyloric portion of the stomach not infrequently causes motor disturbance.

PARTIAL GASTRECTOMY

In gastric ulcers that do not readily yield to medical treatment and, of course, in cancer of the stomach, a partial gastrectomy is indicated. With ulcers in somewhat inaccessible regions, as in the cardiac portion of the stomach, a local excision may be the best therapeutic procedure; but this should be accompanied either by a pyloroplasty, if the tissues of the pylorus and duodenum are normal, or by a gastro-enterostomy if they are diseased. In this way the healing of the gastric wound is promoted by decreasing the acidity of the gastric juice in providing a ready reflux of the duodenal contents and by lessening the work of the stomach by making an easy exit, which reduces the burden on its muscular apparatus. When, however, the lesion is in the body or in the pyloric portion of the stomach, a partial gastrectomy is appropriate.

Partial gastrectomy is divided into two general classes: Billroth I, in which the stump of the stomach is sutured to the duodenum, and Billroth II, in which the stump of the stomach is united to the jejunum and the end of the duodenum is closed.

The lesser curvature of the stomach, where the initiation of motor function resides, should be respected. If in the Billroth I operation it is alined with the upper border of the duodenum, according to nature, and the duodenum is flared open, the lower portion of the gastric stump can be readily closed; sometimes even an end-to-end union may be made. Then motor function is preserved as nearly in the natural manner as possible.[8]

Physiologists have shown that the sensitiveness of the intestinal mucosa to the acid of the gastric juice increases from the duodenum down. If the duodenal mucosa were as sensitive to the acid gastric juice as the mucosa in the lower part of the ileum, every one would probably have duodenal ulcers. It is because of this relative resistance that duodenal ulcer is not more common. When a segment of the jejunum is united to the stump of the stomach in which the acid values of the gastric juice are high, an excellent situation for jejunal ulcer is at once created. In cancer of the pyloric end of the stomach, when the acid of the gastric juice is low or even absent, it may be anticipated that if cancer does not recur the gastric juice will resume some of its acidity. If this happens, the patient would be in a more fortunate position to have the stomach contents empty on to the resistant duodenal mucosa than on the jejunal mucosa. If the gastric resection leaves much of the stomach affected by peristalsis, the stoma should always include the lesser curvature with its active part in peristalsis. But if the actively peristaltic portion of the stomach has been removed, there is no particular indication for having the opening of the gastric stoma high up. When the remaining stump of the stomach is controlled from a motor standpoint solely by tonic contractions, as from a rubber bag, the stoma may just as well be at the lowest point, for here gravity assists in emptying the stomach; but gravity plays but little part in the peristaltic part of the stomach.

In some cases the stump of the stomach cannot be brought to the duodenum, and here a form of the Billroth II operation must be employed. The Hofmeister modification of the Billroth II operation, in which the stoma is made along the lower border of the stomach and the upper part of the gastric stump is closed, is an excellent procedure. It lessens the length of the jejunal loop necessary when a Polya operation is done and gives ample egress for the stomach contents without an unnecessarily large opening that may interfere with gastric digestion. Lahey[9] suggests freeing the oral loop of the jejunum in the Polya operation so that it does not lie below the transverse mesocolon. This should avoid the necessity of an entero-anastomosis, which sometimes arises in these cases.

When a partial gastrectomy is to be done for cancer, hydrochloric acid should be freely given for several days before operation for its antiseptic value—a function of the acid gastric juice first noted by Beaumont.

8. Horsley, J. S.: Surgery of the Stomach and Duodenum, St. Louis, C. V. Mosby Company, 1933, pp. 198-209.
9. Lahey, F. H.: A Method of Dealing with the Proximal Jejunal Loop in Posterior Polya Anastomosis, Surg., Gynec. & Obst. 57: 227 (Aug.) 1933.

PERSISTENTLY RECURRING PEPTIC ULCERS

Unfortunately, there are a few cases of tendency toward peptic ulcer in which no form of therapy, either medical or surgical, seems effective. Harvey Cushing [10] has renewed the interest in Rokitansky's theory of the neurogenic origin of peptic ulcer, asserting that an imbalance between the vagal and the sympathetic impulses (usually an excess of vagal stimuli) is responsible for many peptic ulcers. Crile's [11] interesting work on the suprarenals is also suggestive. Certain it is that, at least in this small percentage of cases of persistently recurring peptic ulcer, some causes outside of the gastro-intestinal tract must be responsible. A discussion of this relationship, however, will carry us too far afield. Balfour [12] has proposed physiologic rest for the stomach by feeding through a jejunostomy for a period of a year or more, and in some peptic ulcers this has produced good results. But when gastric feeding is resumed in such cases the ulcers often recur. Whether complete section of the vagus nerves just below the diaphragm would add to the effectiveness of the treatment it is at present impossible to say, though it is suggestive of beneficial results. In some of these cases a total gastrectomy may be considered, though the eventual results of such a procedure as regards anemia have not been fully determined. There are a few cases in which anemia supervenes and others in which it does not seem to occur.

OPERATIONS ON THE SMALL INTESTINE

In the small intestine, the chief physiologic facts that bear on surgical operations have to do with the active, sensitive and rather delicate peristalsis of the upper part of the small intestine as compared with the lower part, and with the scanty bacterial content of the upper part of the small intestine caused by the bactericidal action of the hydrochloric acid of the gastric juice, whereas in the lower ileum bacteria are abundant. Dragstedt [13] has shown that in the upper part of the small intestine of a dog obstruction will result from an amount of pressure that in the lower ileum will not produce obstruction. The scantiness of bacteria in the upper small intestine together with the more abundant blood supply favors the healing of wounds in this region. An open technic for resection, then, without any unnecessary soiling, preferably an end-to-end union providing a wide lumen and a small diaphragm, is indicated in the upper small intestine. One row of continuous sutures with a few interrupted sutures for reinforcement seems to be better than multiple layers, which turn in much tissue and thus may cause obstruction in this sensitive bowel. The more accurate suturing of the inner coats of the bowel is usually preferable to their blind closure by the so-called aseptic technic.

In the lower small intestine, with the fat encroaching on the sides of the bowel, as has been well demonstrated by Monks,[14] an end-to-end union is less desirable. The dangerous triangular space with its potentialities for infection and poor healing where the mesentery separates to surround the bowel is larger, and suturing the intestine along the fat mesenteric border becomes less safe than in the jejunum. Here peristalsis is not so active, though it is rather strong. If the lumen is small and the fat abundant, it would seem a better procedure to close the ends as aseptically as possible, the cautery and basting stitch being used, and make a lateral anastomosis. Care should be taken to leave no pocket in the oral end of the bowel, because food accumulates in it with the peristaltic urge, and in experimental animals perforation may occur.

OPERATIONS ON THE COLON

The colon is divided by its physiologic function into right and left sides. The right side is the chief means for the absorption of water and salts; the left side is mainly for storage. If excision of the right colon is indicated, a preliminary end-to-side anastomosis of the ileum to the transverse colon should be done, with removal of the right colon at the same or at a subsequent stage. When the transverse or left colon must be resected, complete preliminary rest for one or more weeks should be obtained for this portion of the bowel by an enterostomy in the cecum and first part of the ascending colon, which will divert the entire fecal current from the left colon. This not only provides physiologic rest but reduces the bacterial content of the left colon to about the same as that of the jejunum and so increases the safety of its resection. This safety is still further augmented by the administration of an appropriate intraperitoneal vaccine. When the site of the resection has healed, the colostomy is closed.

CONCLUSION

Some knowledge of the physiologic functions of the gastro-intestinal tract—of its motion, its secretions and excretions, its contents, its power of absorption and its relationship to other organs—is essential to satisfactory surgery of the stomach and intestine.

617 West Grace Street.

10. Cushing, Harvey: Peptic Ulcers and the Interbrain, Surg., Gynec. & Obst. **55**: 1-34 (July) 1932.
11. Crile, G. W.: Recurrent Hyperthyroidism, Neurocirculatory Asthenia and Peptic Ulcer: Treatment by Operations on the Suprarenal-Sympathetic System, J. A. M. A. **97**: 1616 (Nov. 28) 1931.
12. Balfour, D. C.: The Management of Recurrent Ulcer Following Partial Gastrectomy, Tr. Am. Surg. A. **37**: 55, 1929.
13. Dragstedt, C. A.: Acute Dilatation of the Stomach, J. A. M. A. **79**: 612-615 (Aug. 19) 1922.
14. Monks, G. H.: Studies in the Surgical Anatomy of the Small Intestine and Its Mesentery, Ann. Surg. **42**: 543-569, 1905.

ABSTRACT OF DISCUSSION

DR. GEORGE W. CRILE, Cleveland: As Dr. Horsley has said, it is oftentimes more important to treat the patient than the ulcer. The ulcer after all is an end result and a symptom, not a disease primarily. That is well established by the fact that the people who are the most intelligent, the most active, who have the greatest responsibilities, worries and anxieties, are those who are most prone to the development of peptic ulcers. In certain patients, on many of whom operations for peptic ulcer had been performed before I saw them, in some cases as many as six, I have resorted to a procedure that tends to interfere with the sphincterismus at the pylorus and also with the mechanism by which the excited man, the high tempered man and the civilized man interferes with his own processes, the suprarenal-sympathetic system. I have divided the nerves leading from the suprarenal glands, and it has been interesting to note that, as soon as the suprarenal glands are denervated, the patient is relieved. Among forty patients in whom this operation was performed and who had previous operations and recurrences of the ulcer, four were surgeons. As soon as this operation is performed the sphincterismus disappears, the abnormal motility disappears, as shown by the fluoroscopic examination and of course by the immediate relief experienced by the patient. Occasionally there will be some remissions, but these are unimportant as they are rather easily controlled. I cannot state as yet how permanent these results will be. In the oldest case, operation was performed nearly five years ago. If the results prove to be permanent, I should think one would be justified in performing first a left suprarenal denervation and then a resection of the ulcer. If after three or four months the patient is relieved but not cured, the other suprarenal can be denervated.

JAUNDICE

A REVIEW OF SOME EXPERIMENTAL INVESTIGATIONS

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Jaundice appears to be one of the first clinical signs to be mentioned in the history of medicine as characteristic of disease. Continuous investigation has accumulated a mass of information relative to both clinical and experimentally produced jaundice. It is not possible adequately to review all of this material at one time, either from a clinical or from an experimental standpoint. We will limit ourselves to reviewing certain experimental investigations which have added facts of interest to the knowledge of jaundice. Because our interest is largely in the field of hepatic physiology and pathology, our investigations have been limited to those phases of jaundice in which the hepatic factor appears to be paramount. The physiologic changes incident to obstructive jaundice have been reviewed by Ivy,[1] and the extrahepatic functions of bile by Schmidt,[2] so that these phases of the subject need not be presented here.

Jaundice may be produced in animals by many different methods, all of which have one common feature; that is, production within the animal of more bile pigment than is eliminated by the liver at the same time. As far as we are aware, true hemolytic icterus, similar to the condition as seen in the human being, has not been produced experimentally in animals, although jaundice may be produced by injections of hemolyzed blood or by injections of various hemolytic agents. Injection of these substances gives rise to excretion of hemoglobin in the bile and causes retention of bile pigment. The bilirubin that accumulates in the blood after these procedures gives a direct van den Bergh reaction. The jaundice that follows complete removal of the liver, with or without subsequent injections of hemoglobin, may be said to be a hemolytic type of icterus, since only the indirect van den Bergh reaction is obtained. Jaundice that might be termed hepatic may be produced by obstruction of the common bile duct or by impairment of the secretion of bile by injury to the liver. The latter may be produced by administration of chloroform, phosphorus, carbon tetrachloride, and other hepatic toxins. The effects of the jaundice on the animals will vary somewhat, depending on the method used to produce the jaundice, and may also be complicated by the effects of the method itself.

Regardless of the method employed to produce the jaundice, the results noted may be due to three factors always present in the icteric animal: the effect on the body cells of retention of bile in the blood and tissue fluids; the effect of absence of, or alteration of, the bile in the intestinal tract, and the effect of the injury to the liver which accompanies jaundice. As yet, the effects of these three factors cannot be differentiated, except in regard to the effects of the absence of bile from the intestines, which has been determined by many excellent studies on bile fistula animals. Complete loss of bile is compatible with life for an indefinite period if adequate care and a suitable diet are maintained. There are many changes in digestion and absorption in these animals, such as Greaves and Schmidt [3] have shown in the failure of absorption of vitamin D, but these changes can be controlled by proper dietary regimens. Queen, Hawkins and Whipple [4] have added the important observation that modifications which are ineffective on the normal animal may produce marked changes and death of animals with complete biliary fistula. Thus, a short period of time after splenectomy performed on a bile fistula dog there develop an overproduction of bile pigment and marked anemia, which are progressive until death. Some similar agency may be responsible for the fact that dogs with complete obstructive jaundice gradually decline and in spite of all forms of dietary treatment usually fail to survive more than a year.

Some of the nutritional disturbances found in jaundiced animals are associated with loss of normal bile from the intestine, but other disturbances, such as loss of appetite, appear to be due to the effects of the retained bile. The anemia and diminution of plasma protein that occur in the icteric animal may be in part due to dietary and absorptive factors, but it is probable that associated hepatic injury also plays an important part. Smith and Whipple [5] have demonstrated that hepatic injury not only decreases the amount of hemoglobin regenerated while the animal is on standard diets but also that the liver plays a major part in the formation of the plasma proteins. We have found a marked tendency to the development of peptic ulcers on the part of jaundiced animals. These ulcers are usually duodenal and may develop after a few days of jaundice or may not develop for many months, but eventually perforation of an ulcer is the chief cause of death of our animals with complete obstructive jaundice. Because we have not been able to demonstrate any changes in the acidity of the gastric or duodenal content of these animals in which ulcer develops, we are inclined to ascribe the formation of the ulcers to some general effect of the jaundice, in which the resistance of the gastric and duodenal mucosa to formation of ulcer is definitely reduced.

Certain other changes in the jaundiced animal should be noted, which are probably associated with changes in the liver and are only in part specific for jaundice. In view of the associated anemia and decreased protein content of the plasma, it might appear that large amounts of meat should be added to the diet. That the reverse is true is readily seen when the survival time of jaundiced dogs on a meat diet is compared with that of dogs fed mainly carbohydrate and the proteins of milk and eggs. After about three months of complete obstruction of the biliary outflow, few animals will survive a diet of meat for more than a week but will live for several months on a diet of milk and syrup. There is also some relationship existing between the extractives of meat and the ascites that often occurs in the

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1. Ivy, A. C.: Physiologic Disturbances Incident to Obstructive Jaundice: A Review, J. A. M. A. **95**: 1068-1072 (Oct. 11) 1930.

2. Schmidt, C. L. A.: The Extrahepatic Functions of Bile, Physiol. Rev. **7**: 129-150 (Jan.) 1927.

3. Greaves, J. D., and Schmidt, C. L. A.: The Rôle Played by Bile in the Absorption of Vitamin D in the Rat, J. Biol. Chem. **102**: 101-112 (Sept.) 1933.

4. Queen, F. B.; Hawkins, W. B., and Whipple, G. H.: Splenectomy in Bile Fistula Dogs: Bile Pigment Overproduction, Anemia and Intoxication, J. Exper. Med. **57**: 399-418 (March) 1933.

5. Smith, H. P., and Whipple, G. H.: Bile Salt Metabolism: V. Casein, Egg Albumin, Egg Yolk, Blood, and Meat Proteins as Diet Factors, J. Biol. Chem. **89**: 689-704 (Dec.) 1930; VII. Indene, Hydrindene and Isatin, ibid, pp. 719-725; IX. Eck Fistula Modifies Bile Salt Output, pp. 738-751. Whipple, G. H., and Smith, H. P.: Bile Salt Metabolism: VI. Proline, Tryptophane and Glycine in Diet, ibid. **89**: 705-717 (Dec.) 1930; VIII. Liver Injury and Liver Stimulation, pp. 727-738.

terminal stages of obstructive jaundice. If sufficient injury has occurred to the liver (usually about three months of complete obstructive jaundice), feeding of meat, or the administration of beef extract, will produce rapid formation of ascites in animals that were free of ascites when maintained on a diet almost free of these substances; the animals again become free of ascites in a few days after the resumption of the original diet. There are probably other factors involved in the formation of ascites in these animals, as, for example, the reduction of the protein content of the plasma, and altered absorption from the intestine, but the effect of the extractives of meat is most striking when one observes the development of more than 3 liters of ascitic fluid in six hours in an animal weighing 15 Kg. following oral administration of 15 Gm. of meat extract.

Accumulation of bile pigment in the tissues may not be the most important feature of jaundice, but it is certainly the most noticeable. Because of its ease of detection and a fairly satisfactory method of quantitation, more is known about bilirubin than about the other constituents of the bile. Bile pigment continues to be formed in animals after complete removal of the liver, and there can be no doubt that hemoglobin is the material from which it is derived. Injections of hemoglobin increase the formation of bilirubin, as has been demonstrated in the bile fistula animals, jaundiced animals and dehepatized animals. Simultaneous determinations of the bilirubin content of the arterial blood flowing to various organs and tissues, and of the venous blood returning from the same organs and tissues, have demonstrated formation of bile pigment in the spleen, bone marrow and liver. Other tissues investigated do not appear to add bilirubin to the blood. It appears that the bilirubin is formed in the cells of the reticuloendothelial system, which in mammals is greatest in the bone marrow, spleen and liver, and there is evidence to indicate that the bone marrow is normally the main site of formation of bilirubin.

It has not been proved that the hepatic cell forms bilirubin. The main evidence presented to date that the hepatic cell makes bilirubin is that the jaundice produced by certain substances, notably toluylenediamine, is prevented by removal of the liver.[6] Toluylenediamine produces both increase in the formation of bilirubin and retardation of its excretion, together with demonstrable injury to some of the hepatic cells. In order to explain the jaundice produced by this substance, on the basis that the retained bilirubin is formed by the hepatic cells, it is necessary to postulate that toluylenediamine injures the hepatic cells in such a manner that they form more bilirubin than normal and excrete less than normal. This consideration must remain as a possibility until the mechanism of the jaundice caused by toluylenediamine is conclusively determined, although it appears rather unique that injury to a cell should cause it to increase its activity in one respect and decrease it in another.

The liver may be considered as an excretory organ for bile pigment, since not only is the major amount of bilirubin formed outside the liver but accumulation of this substance in the blood and tissues occurs when hepatic excretion is impaired or prevented. Removal of the liver, or ligation of the biliary ducts, prevents excretion of bile into the intestine, and bile pigment formed outside the liver appears in the blood, body tissues and urine. Acute lesions of the liver may also produce jaundice such as follows administration of chloroform, phosphorus, carbon tetrachloride or tetrachlorethane. We also see temporary jaundice following removal of a large amount of hepatic tissue. We have recently observed jaundice following continuous injection of dextrose for many hours at the maximal rate of tolerance. The glycogen content of the liver is increased up to 20 per cent of its weight, but the carbohydrate functions of the liver do not appear altered. Bile pigment, however, is retained in the blood and is excreted in the urine. The jaundice produced by hepatic poisons appears to be due in part to hepatic injury and in part to excessive formation of bilirubin, which cannot all be eliminated by the injured liver. The jaundice that occurs after partial removal of the liver and injection of large amounts of dextrose appears to be due to the fact that these procedures cause the hepatic cells to swell and to obstruct the bile canaliculi.

The van den Bergh reaction for serum bilirubin is indirect in animals that have become jaundiced following complete removal of the liver. The amount of bile pigment that accumulates in the blood for the first twenty-four hours after removal of the liver is comparable in amount to that which is found after an equal interval of time following ligation of the common bile duct and extirpation of the gallbladder. In the latter case the bilirubin of the blood gives a direct van den Bergh reaction. Removal of the liver when obstructive jaundice is present produces serum bilirubin with a true biphasic reaction obtained by the van den Bergh method. If the liver is removed several hours after ligation of the common bile duct and removal of the gallbladder, at a time when a definite direct van den Bergh reaction is present in the serum, the amount of bilirubin reacting directly will be subsequently unchanged. Additional bilirubin will accumulate in the blood after removal of the liver, so that the total amount of bile pigment in the blood will progressively increase at the same rate that it was increasing following ligation of the common bile duct, but the bilirubin that is added to the blood after removal of the liver gives only the indirect reaction. In any other type of jaundice that we have produced experimentally there has been more or less involvement of the liver, and the direct van den Bergh reaction for bilirubin in the blood has been observed.

No important function has been ascribed to bilirubin except that of an excretory product derived from the breakdown of hemoglobin in the body. Hawkins, Sribhishaj, Robscheit-Robbins and Whipple[7] found that anemic dogs formed new hemoglobin from the entire amount of foreign hemoglobin administered but at the same time formed additional bilirubin equivalent to the entire amount of hemoglobin given. These observations indicate that new hemoglobin must be synthesized and that the bilirubin portion of the hemoglobin molecule cannot be utilized in the formation of new hemoglobin, although other portions of the hemoglobin molecule may be incorporated in new hemoglobin.

The bilirubin excreted in the bile is not reabsorbed as such but is acted on by bacteria and perhaps some intestinal enzymes to form urobilinogen and urobilin,

6. Rosenthal, F.; Licht, H., and Melchior, E.: Weitere Untersuchungen am leberlosen Säugetier, Arch. f. exper. Path. u. Pharmakol. **115**: 138-179, 1926.

7. Hawkins, W. B.; Sribhishaj, K.; Robscheit-Robbins, F. S., and Whipple, G. H.: Bile Pigment and Hemoglobin Interrelation in Anemic Dogs, Am. J. Physiol. **96**: 463-476 (Feb.) 1931.

which may be absorbed into the portal system. Most of the absorbed urobilin is absorbed by the liver and excreted again into the intestine. No urobilin is formed if bilirubin is not present in the intestine except in some instances of cholangeitis in which the urobilin is formed in the infected bile ducts. McMaster and Elman [8] found that injury to the liver prevented urobilin being excreted in the bile, and the excess pigment was excreted in the urine. Excessive excretion of bilirubin in the intestine, such as follows excessive destruction of blood, increased the amount of urobilin formed, beyond the capacity of the liver to excrete it immediately, and some of the urobilin was excreted in the urine. Apparently the liver is extremely sensitive in regard to excretion of urobilin, since it appears in the urine in fevers and in many nonspecific infections that do not appear to involve the liver.

Bile salts, like bile pigment, are intimately connected with any consideration of jaundice. Additional interest is afforded by the fact that bile salts have some toxic action on the tissues. Osterhout [9] found that the presence of bile salts decreases the permeability factor of tissues. Horrall and Carlson [10] observed that the toxicity of bile depended on the rate of administration rather than on the total amount administered, and Still [11] concluded that the cholate radical was mainly responsible for the toxicity of bile. Sterner, Bartle and Lyon [12] have reviewed the recent literature on metabolism of bile salts. This may be briefly summarized as follows: The bile salts have one definite function in emulsifying and aiding in the digestion of fats in the intestine, and bile salts stimulate the liver to cause greater amounts of bile to be formed and secreted. Smith and Whipple [5] have conducted a large series of studies on the excretion of bile salts by biliary fistula dogs under a number of different conditions. They found that standard diets of salmon bread produced a constant daily excretion of about 100 mg. of taurocholic acid for each kilogram of body weight, whereas fasting or feeding with sugar reduced this figure to 20 or 40 mg. Feeding of liver, kidney or beef muscle produced from 200 to 300 mg. of taurocholic acid for each kilogram of body weight in twenty-four hours. Casein produced from 125 to 190 mg. of taurocholic acid, ovalbumin produced 50, and whole beef blood increased the excretion of bile salts, but the erythrocytes alone caused a slight decrease. Amino-acids and other substances that possess chemical structures found in taurocholic acid cause increased formation of bile acid if added to certain diets but may be without effect when added to other diets; therefore it would appear that certain amino-acid complexes were necessary for formation of bile salts but that excess of these complexes may be without further effect. Bile salts administered by vein or by mouth are quantitatively excreted in the bile. There are many indications that the liver is probably responsible for elaboration of bile salts, although the evidence to date is not conclusive. Mild hepatic injury, such as is produced by small amounts of chloroform or by an Eck fistula, may greatly reduce the amount of bile salts formed, but the amount of hepatic injury that may be observed microscopically does not always parallel the reduction of formation of bile salts, since phosphorus poisoning may produce extensive hepatic injury, with little reduction in the excretion of bile salts.

Our studies [13] indicate that the normal animal is able to destroy large amounts of glycocholates or taurocholates following administration of these substances by vein or by mouth. After ligation of the common bile duct, more of the injected bile salts appear in the urine but a considerable portion of the bile salts are destroyed. If the liver is completely removed, all of the bile salts administered appear in the urine after a few hours, so that it would appear that the liver plays a prominent part in the destruction of bile acids. Additional evidence of the formation of bile salts in the liver is found in the fact that no bile salts can be detected in the blood or urine after removal of the liver, although bilirubinemia develops and bile pigment is present in the urine, and small amounts of administered bile salts may be detected.

With complete obstruction of the biliary outflow, the amount of bile salts excreted in the urine is only about half of that found in normal animals with biliary fistulas. Injury to the liver by chloroform, carbon tetrachloride or toluylenediamine further reduces the amount of bile salts in the urine and blood. The terminal decrease in excretion of bile salts in continued obstructive jaundice does not occur until considerable secondary hepatic injury is demonstrable. At this time the ability of the liver to destroy bile salts may not be altered, so that the decrease in excretion of bile salts is obviously due to decreased formation of bile salts. Jaundice produced by hepatic toxins such as chloroform, phosphorus, carbon tetrachloride or toluylenediamine in otherwise normal animals gives rise to excretion of bile salts in the urine, and bile salts are found in the blood. As these animals recover, the bile salts disappear from the blood and urine, but bile pigment may still be present in large amounts. Additional hepatic injury, by repeated administration of the toxic agent, may also cause disappearance of the bile salts from the blood and urine. With recovery from hepatic lesions, bile salts are excreted in the bile, and hepatic activity prevents accumulation of these substances in the blood. With further injury, the liver is unable to elaborate bile salts so that they also disappear from the blood.

SUMMARY

Jaundice may be produced experimentally by methods that involve the liver. Complete removal of the liver produces jaundice that might be termed hemolytic, and the bilirubin of the blood is found to respond "indirectly" to the van den Bergh reaction. Other forms of jaundice produced by occlusion of the bile ducts or by hepatic injury increase the bilirubin content of the blood, which is found to give a "direct" van den Bergh reaction.

Experimentally produced jaundice, continued for some time, produces certain typical effects on the animal,

8. McMaster, P. D., and Elman, Robert: Studies on Urobilin Physiology and Pathology: I. The Quantitative Determination of Urobilin, J. Exper. Med. **41**: 503-512 (April) 1925; II. Derivation of Urobilin, ibid., pp. 513-534; III. Absorption of Pigments of Biliary Derivation from the Intestine, pp. 719-738 (June); IV. Urobilin and the Damaged Liver, ibid. **42**: 99-122 (July); V. The Relation Between Urobilin and Conditions Involving Increased Red Cell Destruction, pp. 619-640 (Nov.); VI. The Relation of Biliary Infections to the Genesis and Excretion of Urobilin, ibid. **43**: 753-783 (June) 1926.

9. Osterhout, W. J. V.: Decrease of Permeability and Antagonistic Effects Caused by Bile Salts, J. Gen. Physiol. **1**: 405-408 (March 20) 1919.

10. Horrall, O. H., and Carlson, A. J.: The Toxic Factor in Bile, Am. J. Physiol. **85**: 591-606 (July) 1928.

11. Still, E. U.: On the Toxicity of Purified Bile Preparations, Am. J. Physiol. **88**: 729-736 (May) 1929.

12. Sterner, R. F.; Bartle, H. J., and Lyon, B. B. V.: The Cholagogue Effect of the Intravenous Injection of Sodium Dehydrocholate, with a Résumé of Literature on Bile Salt Metabolism, Am. J. M. Sc. **182**: 822-839 (Dec.) 1931.

13. Bollman, J. L., and Mann, F. C.: The Influence of the Liver on the Destruction of Bile Salt, Arch. Path. **16**: 304 (Aug.) 1933.

owing to the absence of or alteration of bile in the intestine, the presence of bile components in the blood and tissues, and the associated impairment of the liver. Survival of these jaundiced animals is limited by several factors. Nutritional disturbances, in which decreased tolerance to meat is a prominent feature, are important. There appears to be a definite tendency to the occurrence of peptic ulcer. Anemia and a decrease in the proteins of the plasma are usually found to be associated with injury to the liver. Ascites may be formed under conditions in which it does not occur in normal animals.

Formation of bile salts is somewhat reduced in icteric animals but continues to be formed in considerable amounts. Subsequent injury to the liver of the jaundiced animal may completely prevent formation of bile salts, so that they are no longer found in the blood or urine.

SLIGHT AND LATENT JAUNDICE

THE SIGNIFICANCE OF ELEVATED CONCENTRATIONS OF BILIRUBIN GIVING AN INDIRECT VAN DEN BERGH REACTION

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For years we have puzzled over the meaning of a slight increase in the value of serum bilirubin, with or without slight jaundice, barely detectable either by the patient or by the trained physician. Naturally we have suspected that in at least some of these cases the liver has suffered an injury leading to dysfunction, but we could not be sure. In the hope of throwing light on the problem, we have analyzed the data in all such cases encountered at the Mayo Clinic from 1930 to 1931.

It will be remembered that in most laboratories today the concentration of serum bilirubin is classified and measured by van den Bergh's technic. At the clinic, Lepehne's ring test is first applied to determine the type of bilirubin reaction. If, after the diazo-reagent has been added, a purple color appears within one minute, the reaction is said to be "direct;" if the appearance is delayed from two to five minutes, it is called "delayed-direct," and if it appears after five minutes it is called "indirect." Most investigators believe that the direct reaction is given by reabsorbed bilirubin that has passed through hepatic cells normal or diseased; the bilirubin that gives an indirect reaction is supposed not to have passed through the hepatic cells. As a corollary of this, direct reactions are supposed to indicate injury to the liver or obstruction of the ducts; an indirect reaction is found in blood from all normal persons and from patients with hemolytic disease. The delayed direct reaction probably has the same significance as has the direct reaction. In this study we have disregarded all cases in which reactions were direct, because we know that a direct reaction means something is wrong with the liver or ducts. We were not so sure about the significance of the indirect reactions; hence, this analysis.

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The concentration of serum bilirubin also is measured quantitatively. Using Thannhauser and Andersen's [1] modification of the van den Bergh technic, we have found that the serum of most normal persons contains less than 1.5 mg. per hundred cubic centimeters of bilirubin. In order to be safely above this usual range of concentration, we have picked out for the purpose of this study 214 consecutive cases in which the amount was 2 mg. or more per hundred cubic centimeters.

Before continuing, it might be helpful to remember that nowadays cases of jaundice are divided into three groups: (1) cases of extrahepatic jaundice, in which obstruction to the bile ducts is produced in any way; (2) cases of intrahepatic jaundice, in which the disease is in the hepatic cells, and (3) cases of hemolytic jaundice, in which the liver and bile ducts are assumed to be normal, and the bilirubinemia to be due to excessive destruction of erythrocytes.

In this study not only did we hope to throw light on the meaning of increased concentrations of bilirubin with an indirect reaction but also we thought we might learn something about those many patients who claim to be bilious, liverish or toxic but in the examination of whom the usual tests of hepatic function fail to show any sign of disease.

MATERIAL

We found that the records of the 214 cases could be divided into two groups. In the first group were patients who had, as well as patients who had not, disease of the liver and gallbladder. Hemolytic disease was excluded by appropriate laboratory and clinical data. In table 1 are summarized the diagnoses made in cases in which hemolytic disease was absent, and also it is indicated whether or not visible jaundice was present. Chrometzka,[2] Schiff,[3] Hughes [4] and Perkin,[5] among others, previously have noted cases in which concentrations of bilirubin were increased, the reaction was indirect, and the patients had disease of the liver or gallbladder.

In the second group, some type of hemolytic disease was present in each case (table 2). Whereas most of the important types of hemolytic diseases are included in this series of cases, there are others, such as purpura, poisoning by potassium chlorate and by snake bite, and sickle-cell anemia, which may be mentioned for the sake of completeness. Extravasation of blood in the presence of pulmonary infarcts and tubal pregnancy likewise produce excessive hemolysis and bilirubinemia.

The greatest concentration of serum bilirubin encountered in this series was less than .7 mg. per hundred cubic centimeters. The concentration was 3 mg. per hundred cubic centimeters or less in approximately 75 per cent of the cases. It is interesting to note that visible jaundice occasionally is present when the concentration of serum bilirubin is less than 3 mg. per hundred cubic centimeters; on the other hand, it is rarely absent when the concentration is more than 3 mg. per hundred cubic centimeters.

1. Thannhauser, J. S., and Andersen, E.: Methodik der quantitativen Bilirubinbestimmung im menschlichen Serum, Deutsches Arch. f. klin. Med. **137**: 179-186 (Aug.) 1921.
2. Chrometzka, Friedrich: Ueber die Norm des Bilirubinspiegels des Menschen und die Hyperbilirubinamie, Ztschr. f. d. ges. exper. Med. **67**: 475-481, 1929.
3. Schiff, Leon: Serum Bilirubin in Health and in Disease, Arch. Int. Med. **40**: 800-817 (Dec.) 1927.
4. Hughes, T. A.: Observations on the Bilirubin Content of the Blood Serum, Indian J. M. Res. **12**: 403-408 (Oct.) 1924.
5. Perkin, F. S.: Blood Bilirubin: Estimation and Clinical Significance, Arch. Int. Med. **40**: 195-202 (Aug.) 1927.

INCREASED CONCENTRATIONS OF BILIRUBIN IN CASES IN WHICH HEMOLYTIC DISEASE WAS ABSENT

The balance between the formation of bilirubin by the reticulo-endothelial system and its excretion by the hepatic polygonal cells is well maintained in health. The balance is upset by disease, which either increases formation or retards excretion. The concentration of bilirubin is often lower than normal when the erythrocytes are deficient in hemoglobin, as in hypochromic anemia. The concentration of bilirubin increases when hemolysis is excessive, as in hemolytic disease, and when injury and dysfunction of the hepatic cell occur. Such is the modern conception of the physiologic processes relative to bilirubin.

It follows that hepatic dysfunction may well be responsible for the increased concentration of bilirubin in the cases in which hemolytic disease has been ruled out. Interestingly enough, in all cases of this series in which hemolytic disease was absent, hepatic disease or dysfunction is actually or probably present to account for the presence of an increased concentration of bilirubin. Two types of hepatic dysfunction may be recognized: (1) a constitutional type and (2) a type secondary to hepatic disease. Each type will be briefly considered.

TABLE 1.—*Cases in Which Hemolytic Disease Was Absent and in Which Concentration of Serum Bilirubin Was 2 Mg. or More per Hundred Cubic Centimeters*

Diagnosis	Jaundice or History of It	No Jaundice or History of It	Total
Cases in which demonstrable disease of liver or gallbladder was absent			
Negative examination	6	2	8
Functional nervous disorder	12	11	23
Epilepsy	..	1	1
Organic nervous disease	2	2	4
Duodenal ulcer	1	5	6
Syphilis	1	2	3
Miscellaneous	..	3	3
	22	26	48
Cases in which disease of the gallbladder was present			
Chronic cholecystitis	9	4	13
Chronic cholecystitis with stone	4	14	18
Chronic cholecystitis with stone and hepatitis	5	..	5
Chronic cholecystitis with stone and stone in common bile duct	2	..	2
Acute cholecystitis	1	..	1
Cholangeitis	1	..	1
Stone in common bile duct	3	..	3
Chronic nervous exhaustion, postoperative cholecystostomy	3	..	3
	28	18	46
Cases in which disease of the liver was present			
Metastatic carcinoma of the liver	..	4	4
Cardiac decompensation	1	2	3
Secondary obstructive biliary cirrhosis	..	4	4
Latent portal cirrhosis	1	7	8
Toxic cirrhosis secondary to hyperthyroidism	3	12	15
Residual hepatitis following cinchophen poisoning	1	..	1
Residual hepatitis following catarrhal infectious jaundice	9	..	9
	15	29	44
Grand total	65	73	138

Constitutional hepatic dysfunction was described by Gilbert and his associates [6] as simple familial cholemia and simple chronic icterus. In simple familial cholemia the concentration of serum bilirubin was increased, the skin had a slightly yellowish or sallow tint, the conjunctivae were not colored, the urine contained appreciable amounts of urobilin and urobilinogen, and the liver and spleen were affected very slightly, if at all. In simple chronic icterus the concentration of serum bilirubin was increased still further, the skin and conjunctivae had a subicteric or definitely icteric tint, the urine contained considerable amounts of urobilin and urobilinogen (at times even a small quantity of bilirubin) and the spleen and liver were often, although only slightly, affected. The forty-eight cases in our series in which there was no demonstrable disease of the gallbladder or liver belong to these groups; in addition there were ten patients who had disease of the gallbladder, and two who had disease of the liver and who had jaundice long before the development of disease of the gallbladder or liver, and these should be added to make a total of at least sixty cases in which there was some type of hepatic dysfunction. In all probability the condition of the twenty-six patients who were not jaundiced, corresponded to the condition known as simple familial cholemia, and that of the thirty-four patients who were jaundiced typified the condition known as simple chronic icterus. Cases 1 and 2 illustrate the typical features of this type of dysfunction.

TABLE 2.—*Cases in Which Hemolytic Disease Was Present*

Diagnosis	Cases
Leukemia	4
Malaria	6
Splenic anemia	10
Pernicious anemia	31
Chronic hemolytic icterus	16
Probable chronic hemolytic icterus	9
Total	76

CASE 1.—A man, aged 32, had always been aware of slight jaundice. His mother, five brothers and one sister had the same trouble but were otherwise in good health. Physical examination revealed nothing important except the icteric sclerae. Examinations of the blood disclosed cells of normal morphology, normal fragility of the erythrocytes in hypotonic salt solution, and a normal percentage of reticulated erythrocytes. Roentgenologic examination of the gallbladder revealed that it was functioning normally. The bromsulphalein test of hepatic function disclosed retention of dye graded 1. Three readings of bilirubin ranged from 2.8 to 3.4 mg. per hundred cubic centimeters of serum; once the van den Bergh reaction was delayed-direct, and twice it was indirect.

In nine other cases the jaundice likewise began at birth. In four other cases, other members of the family were similarly affected.

CASE 2.—A man, aged 26, complained of exhaustion and slight jaundice, which had appeared about three years before we saw him. He gave no history of cramps, colic or fever. The only important finding was the slight jaundice. Anemia and abnormal fragility of the erythrocytes were absent. The readings for serum bilirubin were 3.4, 3.6 and 4.2 mg. per hundred cubic centimeters, and the van den Bergh reaction was indirect. Roentgenologic examination of the gallbladder disclosed that it was functioning normally.

Two years later the patient returned; he was still weak and tired; the jaundice was unchanged. The blood picture was not that of hemolytic icterus. The reading for serum bilirubin was 4.2 mg. per hundred cubic centimeters and the van den Bergh reaction was again indirect.

Fragility of the erythrocytes in hypotonic salt solution was normal.

6. Gilbert, A., and Lereboullet, P.: La cholémie simple familiale, Gaz. hebd. de méd. **49**: 889-897, 1902; Sur la teneur en bilirubine du sérum sanguin dans la cholémie simple familiale, Compt. rend. Soc. de biol. **58**: 937-940 (June 3) 1905; La cholémie simple familiale, son importance en pathologie, J. méd. franç. 110-119 (March) 1910. Gilbert, A.; Lereboullet, P., and Herscher, P.: Les trois cholémies congénitales, Bull. et mém. Soc. méd. d. hôp. de Paris **24**: 1203-1211 (Nov. 15) 1907.

Two months later, during a bilious spell, the concentration of serum bilirubin was 6.3 mg. per hundred cubic centimeters and the van den Bergh reaction was delayed-direct. The test of fragility of erythrocytes gave a normal result. Seven months after that, the condition of the patient and the results of laboratory examinations were similar to those found on his first examination. In addition, a bromsulphalein test of hepatic function failed to give evidence of any retention of dye.

In thirteen other cases the jaundice likewise began after birth. In one case, other members of the family of the patient were similarly affected. The onset never was spectacular. The jaundice was usually so slight that it is probable that in some cases it was present long before it was noticed. It is certain that a visible grade of icterus, easily recognizable, has escaped the attention of ten of the thirty-four jaundiced patients. Under these circumstances it is possible that jaundice and hepatic dysfunction, listed as beginning some years after birth, really had its onset at a very early age. It is also worth noting that, although seven patients were sure the jaundice had been absent at intervals, it showed no tendency to disappear permanently.

These examples of chronic and intermittent jaundice resemble cases of chronic hemolytic jaundice. It is significant, however, that no history of hemolytic crises with anemia, no evidence of increased destruction of blood or increased regeneration, or no constitutional variations in morphology of the erythrocytes peculiar to chronic hemolytic icterus were present. Moreover, the spleen was not palpable; in fact, all the criteria on the basis of which a diagnosis of chronic hemolytic icterus is commonly made were lacking in these cases. These fundamental differences from chronic hemolytic icterus were likewise noted in the cases in which jaundice was absent.

In spite of the fundamental differences, the constitutional jaundice in these cases is often considered to be of hemolytic origin. Weber,[7] for one, Schiff for another, and Gänsslen, Zipperlen and Schüz[8] interpreted such cases as being atypical examples of chronic hemolytic icterus. That such an interpretation is made is not surprising when one remembers that constitutional jaundice occurs in families the members of which also have chronic hemolytic icterus. Moreover, since it is known that spherical microcytosis may be lacking in certain cases of chronic hemolytic icterus and that normal fragility of the erythrocytes may be present at one time and abnormal fragility at another time, it is possible that in some of these cases later there may be evidence of hemolysis. The assumption, however, of a hemolytic origin for the hyperbilirubinemia in these cases is hardly justified without more evidences of excessive hemolysis.

Pende[9] classified the hepatic dysfunction of this group of patients among forms of constitutional inadequacy, and van den Bergh[10] expressed the belief that the elevated threshold for excretion of bilirubin in these cases is physiologic. Mogena,[11] on the other hand, has expressed his feeling that the increase is invariably pathologic. In our opinion, actual dysfunction of the polygonal hepatic cells exists. When jaundice appears years after birth, we believe that some mild hepatic poison has been acting on a constitutionally inadequate and susceptible hepatic cell. The curious tendency of the jaundice to appear or to increase following emotion, nervous breakdowns, "bilious attacks," constipation or diarrhea indicates that the mechanism for excretion of bilirubin in these cases is easily influenced. The occasional occurrence of slight retention of dye, shown by the bromsulphalein test, and the occasional change of an indirect reaction to a delayed direct reaction are further evidence that actual hepatic dysfunction exists.

Especially interesting is the so-called nervous icterus which occurs in this type of hepatic dysfunction. We had as patients a physician who turned yellow after a day of excitement, a housewife whose slight chronic icterus increased when she became angry, and a woman whose chronic icterus began after a fright; all of these cases may represent examples of hepatic dysfunction due to emotion. Chrometzka mentioned a patient who turned yellow following an attack of renal colic. He also demonstrated the influence of nervousness on the content of bilirubin in the serum in the subicteric range. He found that in some cases concentrations that had been increased above normal on admission returned to normal a few days after registration. Eppinger and Hess[12] assumed that such spasmodic and emotional icterus was due to constitutional vagotonia, with spasm of the common duct of vagal origin.

Dysfunction secondary to hepatic disease appears in cases of toxic hepatitis due to chronic passive congestion and hyperthyroidism, in cases in which there are metastatic malignant growths, and in compensated biliary and portal cirrhosis (table 1). In our opinion, hepatic dysfunction in these cases of hyperthyroidism is due to hepatic injury of slight degree, but of the type described by Weller[13] and by Beaver and Pemberton.[14] The presence of hepatic dysfunction in the various types of cases in this group is confirmed by the almost universal occurrence of some degree of retention of dye.

Dysfunction secondary to hepatic injury persists after disappearance of the acute phase of toxic hepatitis and biliary disease. In one case, dysfunction, as measured by the concentration of serum bilirubin and by the bromsulphalein test, persisted months after the jaundice of toxic hepatitis resulting from poisoning by cinchophen had disappeared. In other cases a history of chronic or intermittent jaundice was obtained. One such patient, who was a missionary, stated that jaundice had first appeared when he went to the tropics, and that the jaundice reappeared whenever he returned there. In another case the initial hepatic injury seems to have been the result of hyperthyroidism, and in others of catarrhal or infectious jaundice.

CASE 3.—A man, aged 36, complained of jaundice. The initial attack, at the age of 18 years, had been severe and accompanied by high fever. Since that time his sclerae had been yellow at times, especially when the infection of the upper part of the respiratory tract was present. The last attack had begun six weeks before we saw him and had lasted one week. On examination, jaundice was not discernible. Anemia, erythro-

7. Weber, F. P.: Congenital Jaundice in Man, Proc. Roy. Soc. Med. (Clin. Sect.) **21**: 3-4 (Oct.) 1927. Weber, F. P.: A Hemolytic Jaundice Family, Internat. Clin. **3**: 148-156 (Sept.) 1931.

8. Gänsslen, Max: Zipperlen, E., and Schüz, E.: Die hämolytische Konstitution, Deutsches Arch. f. klin. Med. **146**: 1-46 (Jan.) 1925.

9. Pende, Nicola: Constitutional Inadequacies, Philadelphia, Lea & Febiger, 1928, pp. 184-185.

10. van den Bergh, A. A. H.: Haemolytic Jaundice or Constitutional Hyperbilirubinemia, Nederl. tijdschr. v. geneesk. **77**: 4429-4435 (Sept. 30) 1933.

11. Mogena, H. G.: The Clinical Significance of Hyperbilirubinemia, Lancet **1**: 1187-1189 (June 8) 1929.

12. Eppinger, Hans, and Hess, Leo: Vagotonia: A Clinical Study in Vegetative Neurology, New York, Nervous and Mental Disease Publishing Company, 1915.

13. Weller, C. V.: Hepatic Lesions Associated with Exophthalmic Goiter, Tr. A. Am. Phys. **45**: 71-76, 1930.

14. Beaver, D. C., and Pemberton, J. de J.: The Pathologic Anatomy of the Liver in Exophthalmic Goiter, Ann. Int. Med. **7**: 687-708 (Dec.) 1933.

cytes of abnormal morphology or fragility, and an abnormal percentage of reticulated cells, were absent. The reading for bilirubin was 2.1 mg. per hundred cubic centimeters and the van den Bergh reaction was indirect. The bromsulphalein test of hepatic function gave no evidence of retention of dye. Roentgenologic examinations of the gallbladder, after administration of dye, disclosed that the organ was functioning normally.

In this case the initial attacks as well as subsequent attacks of jaundice suggested an infectious condition. The laboratory examinations excluded chronic hemolytic icterus. In other cases, occasional slight retention of dye and a delayed-direct van den Bergh reaction support in small measure our conception of persisting hepatic dysfunction in these cases. Similarly, in all but four cases of disease of the biliary tract the history of attacks of jaundice, and the changes found at the operating table, cholangeitis or hepatitis, point to previous hepatic injury, with residual injury to the liver possibly explaining the increased concentration of bilirubin. Hurst [15] demonstrated hepatic dysfunction associated with cholecystitis by means of the levulose tolerance test and expressed the belief that in such cases medical treatment should follow surgical removal of the offending organ.

The decision that constitutional dysfunction, or dysfunction secondary to hepatic injury, accounts for the increased concentration of bilirubin in the individual cases of this series presenting organic disease is a difficult one to make. In some cases of organic disease the history of the jaundice permits it to be classified as constitutional. Thus, we know that the jaundice had been present in one case since birth, and in another for six years, before the development of hyperthyroidism. In two cases the jaundice had appeared at birth and had lasted for thirty-five and forty years before the appearance of symptoms referable to the gallbladder. Similarly, in five cases the jaundice, which had begun at the respective ages of 14, 20, 24, 25 and 30 years, had lasted respectively thirty-six, seven, six, ten and nineteen years before the appearance of disease of the gallbladder. Concerning these nine cases there does not seem to be much doubt that constitutional dysfunction antedated the appearance of organic injury. In the cases of disease of the gallbladder and liver without jaundice, it is often impossible to distinguish the two types of dysfunction; it is quite likely that a degree of constitutional dysfunction insufficient to produce jaundice had existed before development of the biliary and hepatic disease in some of these cases also.

Clinical Importance.—Eight patients who had constitutional hepatic dysfunction made no complaints, and no disease was discoverable by physical and laboratory examinations. Six of the eight wished to be examined only because of the jaundice. It appears that constitutional hepatic dysfunction is compatible with health.

Patients with constitutional dysfunction of the liver seem to develop functional disease frequently. The disease was so classified in twenty-one cases. This series cannot be studied statistically, however, as a control series was not available and patients with functional disease make up a high percentage of any group. The data therefore do not permit the conclusion that constitutional hepatic dysfunction predisposes to functional disease. For like reason, conclusions regarding the relationship between duodenal ulcer and constitutional dysfunction cannot be made.

It does seem significant however that, in ten, or 29 per cent, of the thirty-four patients who had jaundice of the constitutional hepatic type, disease of the gallbladder eventually developed. The duration of the jaundice before the development of symptoms of disease of the gallbladder in these cases excludes the gallbladder as the cause of the jaundice. The high percentage of this group in which disease of the gallbladder developed may mean that constitutional hepatic dysfunction, at least of the grade capable of producing jaundice, predisposed to disease of the gallbladder.

Patients with either constitutional or acquired types of hepatic dysfunction frequently complain of "biliousness." Migraine and episodes of exhaustion, together with anorexia, dull headaches, bad taste in the mouth and constipation, are the syndromes to which laymen apply the term "biliousness." Hunt [16] recently has reviewed the relation of migraine to disease of the gallbladder and liver. He has concluded, contrary to the opinions of others, that dysfunction of the gallbladder is not the cause but may be the result of repeated migrainous attacks. He has suggested that some hepatic dysfunction may be the cause of migraine in certain cases, and he has found support for this belief in the attacks of migraine provoked by magnesium sulphate introduced into the duodenums of patients who have undergone cholecystectomy, and also in the occasional good results that have followed treatment of migraine with bile salts. McClure and Huntsinger [17] claim to have demonstrated hepatic dysfunction in 90 per cent of seventy-two cases of migraine. Diamond [18] found elevated concentrations of bilirubin among thirty-five of thirty-eight patients who had migraine; he believed this to be evidence of hepatic toxemia. Certainly a relationship betwen hepatic dysfunction and migraine exists in some cases, but it is difficult to separate cause and effect. The sequence of headache and jaundice in the cases of this series suggests that the sympathetic storm, of which the headache is one expression, likewise provokes hepatic dysfunction.

Case 4 will illustrate the second syndrome described by laymen as biliousness:

CASE 4.—A man, aged 24, first registered at the clinic in September 1919. He complained of jaundice and biliousness. His sclerae had always been yellow, just as his father's had been. Every few weeks, episodes of exhaustion, mental torpor, headache, constipation and gaseous indigestion occurred, during which exacerbation of the icterus took place. The attacks were precipitated by overeating. The slightly yellowish tint of the skin and sclerae was the only significant physical finding. The fragility of the erythrocytes was normal, and there was no anemia.

The patient returned again in 1923, and the symptoms and conditions found were identical. In addition, the urine contained a trace of urobilin and urobilinogen. The percentage of reticulated cells was 0.6 and 0.7. We last saw the patient in 1930, when he was 35 years of age. His condition was the same as before. No evidence of hemolytic icterus could be obtained in the laboratory. The readings for serum bilirubin were 3.4 and 1.9 mg. per hundred cubic centimeters. The van den Bergh reaction was indirect. A roentgenogram of the

15. Hurst, A. F.: On Being Liverish, Libman Anniversary Volume **2**: 573-576, 1932.

16. Hunt, T. C.: Bilious Migraine: Its Treatment with Bile Salt Preparations, Lancet **2**: 279-285 (Aug. 5) 1933.

17. McClure, C. W., and Huntsinger, Mildred E.: Observations on Migraine, Boston M. & S. J. **196**: 270-273 (Feb. 17) 1927; Paroxysmal Headaches: II. Observations on the Etiology, Symptomatology and Treatment of the Migrainous State, New England J. Med. **199**: 1312-1317 (Dec. 27) 1928.

18. Diamond, J. F.: The Value of Routine Estimations of Blood Bilirubin, with a Report of 567 Cases, Including a Group of Unrecognized Toxic Hepatitis, Am. J. M. Sc. **176**: 321-331 (Sept.) 1928.

gallbladder after oral administration of dye indicated that the organ was functioning normally.

The patient in the case just reported probably had constitutional hepatic dysfunction. Patients who have hepatitis persisting after severe hepatic injury also complain of jaundice and biliousness. The attacks were said to have been precipitated by the eating of rich, greasy or fatty foods, or by constipation. In some cases, slight enlargement or tenderness of the liver, a history of having passed light-colored stools, as well as the appearance of jaundice, focused the attention on the liver as the offending organ. It is not difficult to understand why such patients are convinced that the liver is "out of order." It is also easy to see why patients who make similar complaints, but who do not have visible jaundice, likewise blame the liver for their disability. In the eyes of members of the medical profession, however, a conception of mild or functional disturbance of the liver has fallen into disrepute. However, Hurst, that able exponent of scientific medicine, has expressed the belief that such dysfunction exists at times. He has called attention to its occurrence in cases of acute alcoholism before the development of cirrhosis, in cases of hepatitis developing in the tropics, believed by him to be a form of amebic hepatitis, and in cases of cholecystitis in which symptoms persist after cholecystectomy. It does seem that the liver plays a part in producing the jaundice, but it is not always clear that the liver is the sole cause of the symptoms. In some of our cases, hepatic dysfunction, indicated by increased concentration of bilirubin, seemed to be merely the result of nervous influences.

The Significance of the Indirect van den Bergh Reaction.—The indirect character of the van den Bergh reaction may be cited as evidence that hepatic dysfunction does not account for the increased concentration of bilirubin in these cases. According to the accepted teachings, the indirect van den Bergh reaction is found in the serum of normal patients and of those who have hemolytic disease; when hepatic injury takes place, the indirect reaction changes to the direct. We have seen, however, increased concentrations of bilirubin in serum giving an indirect van den Bergh reaction return to normal concentrations as healing took place in the liver that had been injured by chronic passive congestion and hyperthyroidism. In these cases the van den Bergh reaction may not be direct at any time in the course of the illness. In other cases we have seen the van den Bergh reaction change from direct to indirect, and the increased concentration of bilirubin subsequently return to normal during convalescence from hepatic parenchymal injury. A case of hepatitis caused by cinchophen in this series is a case in point. This patient had a severe attack of cinchophen hepatitis in December 1930 and January 1931. April 8, 1931, the reading for bilirubin was 2.2 mg. per hundred cubic centimeters of serum, and the van den Bergh reaction was indirect. Retention of dye was graded 3. June 10, the reading for serum bilirubin was 1.8 mg. per hundred cubic centimeters, and retention of dye was graded 1. August 18, the reading for serum bilirubin was 1.4 mg., and retention of dye was graded 0. It is significant that parallelism exists between the fall in concentration of bilirubin and the return of normal hepatic function, as indicated by the degree of retention of dye. In other cases the change of an indirect to a delayed-direct reaction shows that some process is at work which can change the reaction. A change in type from indirect to delayed-direct or to direct reaction rarely takes place in constitutional jaundice and often is the case in jaundice due to organic disease. In short, an indirect van den Bergh reaction may occur in hepatic disease even when mild retardation of excretion of bilirubin occurs. In fact, we believe that a concentration of bilirubin, increased over normal, is good evidence of hepatic dysfunction, regardless of the type of van den Bergh reaction, provided hemolytic disease is not present; and, as we shall see, it may be good evidence of hepatic dysfunction in certain cases of hemolytic disease.

INCREASED CONCENTRATIONS OF SERUM BILIRUBIN IN CASES IN WHICH HEMOLYTIC DISEASE WAS PRESENT

Hepatic dysfunction in hemolytic disease has received scant attention. Excess of bilirubin in the blood serum is commonly considered to be the result of increased hemolysis. Rich,[19] however, has expressed the opinion that conditions which are responsible for increased production of bile pigment are almost always associated with conditions that depress the excretory function of the liver. Well known but little emphasized pathologic changes are leukemic infiltrations in leukemia; hepatitis in malaria, severe infections and intoxication; cirrhosis in splenic anemia, and the fatty liver in pernicious anemia. The hepatic lesions in chronic hemolytic icterus are not often considered. Giffin [20] and Pemberton are among the authors who have given the matter some attention. Giffin [20] pointed out that hepatic injury develops in this disease. Pemberton,[21] in a recent study, reported that the operative data were suggestive of hepatic disease in fifty-five of 113 cases. Pathologic changes ranged from adhesion to the surrounding organs, enlargement, congestion and increased density to well marked cirrhosis with ascites. Such hepatic injury leads to changes in results of tests of hepatic function, indicating dysfunction. Retention of dye in varying degrees may occur in most types of hemolytic disease. This is especially true in cases of chronic hemolytic icterus, concerning which Giffin [22] has the impression that retention of dye, graded 1 or 2, is usually present before cirrhosis develops. In all cases of this series in which a bromsulphalein test was done, retention of dye was graded 2. In the great majority of cases of chronic hemolytic icterus the direct van den Bergh test is absent. However, in an occasional case the reaction becomes delayed-direct or direct. Such reactions were not due to obstructive jaundice in Pemberton's series. They are reliable evidence of hepatic injury when disease of the bile ducts is not present. They should be so interpreted here.

The nature of the hepatic injury is questionable. Rich has expressed the belief that anoxemia due to the anemia injures the hepatic cells, producing central necrosis and a depression of excretory function. The anemia did not seem marked enough to explain the hepatic injury in all the cases of this series. However, we did not determine whether or not anoxemia was present. Rich has likewise pointed out that clinically and experimentally the reserve excretory power of the liver is so great that excessive formation of bilirubin alone rarely accounts for the jaundice, and that a

19. Rich, A. R.: The Pathogenesis of the Form of Jaundice, Bull. Johns Hopkins Hosp. **47**: 338-376 (Dec.) 1930.
20. Giffin, H. Z.: Diseases of the Spleen, Oxford Med. **4**: 53-78 (Oct.) 1931.
21. Pemberton, J. de J.: Results of Splenectomy in Splenic Anemia, Hemolytic Jaundice and Hemorrhagic Purpura, Ann. Surg. **94**: 755-765 (Oct.) 1931.
22. Giffin, H. Z.: Personal communication to the authors.

depression of excretory hepatic function must likewise be present. The evidence for the presence of hepatic injury and dysfunction in these cases is so good that we agree that it, as well as excessive hemolysis, may be a cause of an increase in the concentration of bilirubin, in a majority of cases of hemolytic disease.

SUMMARY AND CONCLUSIONS

An analysis of 214 cases was made in which the concentration of the bilirubin was 2.0 mg. per hundred cubic centimeters of serum or greater, and in which the van den Bergh reaction was indirect. In 138 cases, hemolytic disease was absent; in seventy-six cases it was present.

Increased concentrations of bilirubin in the cases in which hemolytic disease is absent means, in our opinion, hepatic dysfunction. The dysfunction has been found to be either constitutional or secondary to hepatic injury. In hemolytic disease, excessive hemolysis is the accepted explanation of the increased concentration of bilirubin. The almost universal presence of some degree of hepatic injury associated with hemolytic disease suggests, however, that hepatic injury and dysfunction may also be partly responsible for elevation of the concentration of bilirubin.

The indirect reaction supposedly rules out the presence of hepatic injury. Actually, however, bona fide hepatic disease has been demonstrated in many cases of this series. Moreover, we have witnessed the van den Bergh reaction change from direct to indirect during convalescence from the hepatic injury while increased concentration of bilirubin was still present. The concentration of bilirubin subsequently returned to normal. We have also seen increased concentrations of bilirubin in serum which never had given a direct van den Bergh reaction return to normal concentration as the process of reparation in the liver proceeded. For these reasons, it appears that an indirect reaction in serum containing bilirubin in amounts more than normal does not always mean hemolytic disease and in fact may definitely point to associated hepatic injury.

Some patients who complain of being bilious actually have slight hepatic dysfunction. The dysfunction may be constitutional or secondary to hepatic injury. It is not clear that all symptoms actually are due to the hepatic dysfunction, but it is probable in some instances that the hepatic dysfunction may be only one of the manifestations of a widespread sympathetic or toxic reaction.

The evidence strongly suggests that among patients who have constitutional dysfunction of the liver, at least of a degree great enough to produce jaundice, disease of the gallbladder is prone to develop. Of the cases studied, in 29 per cent cholecystic disease already has developed. Many of the remaining patients are young. The percentage may increase as these patients grow older.

The mechanism for secretion of bilirubin is a sensitive one. It is influenced by emotion and by disturbances of the sympathetic nervous system, as well as by very minor degrees of hepatic injury. An increased concentration of bilirubin may be the one laboratory evidence of dysfunction and it should be used more widely. It will in all probability disclose many unsuspected cases of mild functional and organic disturbances of the liver as well as a group of individuals of a constitutional type especially susceptible to disease of the gallbladder.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MANN AND BOLLMAN AND DRS. ROZENDAAL, COMFORT AND SNELL

DR. I. S. RAVDIN, Philadelphia: In 1925 Dr. Muller, Dr. Elizabeth Glenn Ravdin and I presented before this association some studies on the serum bilirubin in which the van den Bergh reaction for the quantitative determination was used. At that time the opinion was more or less general that the Meulengracht test was simpler and offered just as much information as did the method of van den Bergh. Of this we have never been convinced, since a variety of pigments in foods may enter the blood stream and cause a rise in the Meulengracht figures, while the diazo reaction remains unaffected by them. A possible explanation for the production of jaundice following the prolonged intravenous administration of dextrose in large amounts may be found in the work of Forsgren, who showed that glycogen storage and bile formation do not take place at the same time. The patient with an obstruction of the common bile duct presents a serious surgical problem. Of major import is the tendency of these patients to bleed following operation. There is no marked change in the serum calcium or fibrinogen in these patients. Several years ago we reported that dextrose reduced the tendency to postoperative hemorrhage and this has now been adequately confirmed by other investigators. We have therefore given up the use of calcium in the preoperative preparation of jaundiced patients. Drs. Mann and Bollman have called attention to the effect of the absence of bile in the intestinal tract. There can be no doubt that the daily restoration of from 150 to 400 cc. of bile into the duodenum of the patient is of considerable value when the total bile is being diverted externally. The asthenia that so frequently is observed following common duct drainage is markedly reduced by this procedure. The edema that is seen in certain of these cases and is in part associated with a diminution of the plasma protein can be controlled by adequate diet and the addition of bile to the gastro-intestinal tract. However, certain of the instances of bile ascites are also in part due to a rise in the portal venous pressure incident to the hepatic ductal obstruction when sufficient collateral circulation does not take place, since ductal obstruction results in portal venous stasis. In the patient whose common duct has been obstructed for a considerable period and whose gallbladder is damaged, the bile salts, as measured by the Gregory-Pascoe reaction, disappear from the bile drainage from the liver immediately after the operation and may not again appear for some time. We believe that their reappearance indicates a return of the liver to normal activity.

DR. A. C. IVY, Chicago: One point in the paper by Drs. Mann and Bollman is in regard to the occurrence of peptic ulcer with obstruction of the common bile duct. My associates and I have been able to confirm that finding in our laboratory. If one produces, in a dog, a condition that leads to a chronic biliary tract infection, with a mild hepatitis, and an elevated icteric index, the incidence of ulcers in the various series amounts to from 40 to 80 per cent. We are now observing a series of animals in our laboratory in which we have performed a cholecystoduodenostomy with pyloric exclusion, and gastrojejunostomy, and so far the incidence of jejunal ulcer is 60 per cent. As time goes on, I believe that the internist will find chronic biliary tract infection to be associated with ulcer of the duodenum more frequently than he has heretofore suspected. Another point that Drs. Mann and Bollman pointed out is that the excessive administration of dextrose in an animal with a subnormal or even a normal functioning liver may cause jaundice. This is interesting in regard to the effect of carbohydrates on the formation of bile. Carbohydrates either have no effect on or depress the formation of bile; in other words, the act of storing of glycogen tends to suppress the elimination of bilirubin. This is evidence of a differential functional activity. Another instance is that, if one injects some bilirubin and bile salts intravenously at the same time, there results an increase in the formation of a light, limpid bile, but there is a retention of the injected bilirubin in the blood stream. The administration of bile to biliary fistula patients is a sound procedure, but according to experiments that we have performed on dogs the administration of bile to subjects with complete obstructive jaundice is deleterious. Whether or

not bile salts should be administered to increase the rate of bilirubin elimination after a common bile duct obstruction has been relieved I think is a matter that has yet to be demonstrated by actual experimental data. The "differential activity" of the liver is important not only from a therapeutic standpoint but also from a diagnostic standpoint. I should like to ask Dr. Mann whether there is any evidence indicating that the consumption of fluids in large quantities might be helpful in promoting the elimination of bile salts and bilirubin in the urine in jaundice cases. I ask that question because it is one that has been put to me frequently. Or does he think that the administration of large quantities of fluid to the jaundiced patient might be harmful in view of the fact that not only the kidney but also the liver is concerned in the maintenance of the water balance of the body, and that there is a tendency to dilution of the blood in the presence of hepatic damage.

DR. M. A. BLANKENHORN, Cleveland: There has been much disappointment in urobilinogen tests in the past because they were too complicated and too much was expected; but, when the simple qualitative test with Ehrlich's reagent is used as a method to demonstrate that bile ducts are draining, the test has value. There is, however, a phase in certain liver disorders when no bile is drained into the intestine; in this phase the urobilinogen test is misleading. However, in just that same phase the galactose tolerance test has been found most useful in estimating liver damage. These two tests thus combined overcome each other's difficulties and limitations and should be better than any single test for liver disease and likewise better than employing all the tests in an effort to get an average.

DR. LEON SCHIFF, Cincinnati: I obtained a negative galactose test in twenty of twenty-one cases of obstructive jaundice due mostly to common duct stone and malignant neoplasm of the head of the pancreas. I have had cases of cirrhosis in which a positive test was obtained. In most of these cases the results were negative. A positive test may indicate some associated parenchymal damage to the liver at the time. Banks and Snell have noted the development of a positive test, which subsequently disappeared in cases of cirrhosis. I had occasion to make an interesting observation in a case of catarrhal jaundice with a high galactose output. As the jaundice persisted, the liver diminished in size, ascites appeared, and a subacute cirrhosis apparently developed. It was interesting to note a drop in the galactose output coincident with the development of the cirrhosis. I believe that the galactose test is of great help in the differential diagnosis of jaundice. If a negative test is obtained on one occasion, the test should be repeated a few days later, particularly if a discrepancy exists between the clinical and laboratory observations.

DR. V. C. ROWLAND, Cleveland: The paper of Drs. Rozendaal, Comfort and Snell establishes again the limitations of the indirect van den Bergh reaction as specific evidence of hemolytic jaundice. Practically the distribution of bile pigment in clinical jaundice may be determined more simply and satisfactorily by examining the serum (icteric index), the duodenal aspirate, and the feces and urine for bilirubin and urobilin. High bilirubin and bile salt content in serum and urine, with low content in duodenal aspirate and stool, indicates obstructive jaundice more directly than a "direct" van den Bergh. The reverse, a high pigment content in the duodenal aspirate and stool, with a dissociated, acholuric jaundice, indicates a hemolytic disease better than an indirect van den Bergh reaction. The conception of hepatic dysfunction either constitutional or toxic as a basis for latent or slight jaundice in the absence of hemolytic disease is logical and consistent with the physiology of other glandular organs. Toxic and infectious damage and probably also profound emotional disturbances will produce such effects on glandular cells. A bilirubin reading in excess of 1.5 or 2 mg. per hundred cubic centimeters of serum is abnormal and may be regarded as a sensitive liver function test, so far as the function of pigment excretion is concerned. Since the balance between the formation of bilirubin by the reticulo-endothelial cells and its excretion by the hepatic polygonal cells is disturbed in certain individuals by toxic and nervous factors, the appearance of slight jaundice after an acute digestive upset, however suggestive of gallbladder colic, cannot be regarded as confirmatory of that diagnosis. This is often assumed when no pathologic condition can be demonstrated by cholecystography or at operation. Further data would be desirable on the probability of late gall tract disorders, especially gallstones, in individuals with a constitutional or acquired hyperbilirubinemia. As the authors indicate, it is difficult to distinguish cause from effect in these cases of latent jaundice, in relation either to organic disease or to associated functional disorders such as migraine. However, Mayo has reported a high percentage of bile pigment calculi in his series of hemolytic jaundice cases. Apparently pigment concentration leads to stone formation. In all probability, obesity and other factors conducive to ordinary cholelithiasis would tend to bring out the latent disorder. Twenty-nine per cent of the authors' patients, many of whom are still young, already show cholecystic disease. This suggests very definitely that there may be a preventive opportunity by personal hygiene and medical management in the chronic cases of latent jaundice. It will be helpful to look on all such cases as presenting potential or incipient liver disease.

DR. I. R. JANKELSON, Boston: There are two possible errors in administering galactose by mouth and estimating the amount secreted in the urine: first, incomplete absorption or delayed absorption from the intestinal tract; second, interfered with or delayed secretion to the urinary tract in the presence of pathologic changes in the tract. In order to obviate these two possible errors, I have started an injection of galactose intravenously and determination of the remaining amount of galactose in the blood as a modification of the galactose test. My experience is limited but I find that in normal liver cases at the end of an hour there is no galactose to be found in the circulating blood. In liver disorders there is a variable amount of galactose left in the circulating venous blood at the end of an hour, and in some cases at the end of two hours. The amount of liver damage is judged by the quantity of galactose remaining in the blood at various intervals.

DR. FRANKLIN W. WHITE, Boston: The simplicity of the galactose and urobilinogen tests should be emphasized. They are both tests of the urine that can be easily done and repeated. The expense is very small except for the cost of the galactose. In the Harvard Teaching Service at the Boston City Hospital we have found that urobilinogen is almost invariably absent in the obstructive cases and that it is almost invariably increased in the cases that show much liver cell damage. The two tests back each other up and bridge over the gaps. The more acute the case, the more valuable these two tests become; in the more chronic cases, with opportunities for liver cell regeneration and compensation, the tests are less useful. There are bound to be exceptions. We found one case of subacute yellow atrophy in which both tests were negative. The urobilinogen and galactose tests have had a rather bad name because they have been used indiscriminately in all kinds of liver diseases. Their real value appears when they are used for a definite purpose in a limited group of cases. The urobilinogen tests should be repeated from day to day in order to get the most out of them. There is considerable variation from day to day and from time to time on the same day. I believe these two tests give real diagnostic help and should be used more.

DR. HARRY SHAY, Philadelphia: It may be of interest to point out a few additional facts regarding galactose metabolism in order to convince the most hardened skeptic of the value of the galactose tolerance test in jaundice. To use urinary excretion as a measure of galactose utilization, it is obvious that there must be no renal threshold for galactose. That fact was adequately demonstrated some time ago by Folin and Berglund, and has been more recently by Harding and Van Nostrand. I bring this up because of the recent tendency, as indicated by Dr. Jankelson's discussion, to utilize the blood galactose curve in preference to the urinary excretion. Since it is reasonably certain that there is no renal threshold for galactose, I cannot see the necessity of complicating a simple laboratory procedure and converting it to one almost prohibitive for routine clinical use. Further, the determination of the blood sugar would be of no value unless the galactose level was separately determined, since the metabolic factors

are not the same for galactose and dextrose. The other question of great importance is whether galactose after it passes the liver is utilized by any other tissue of the body. In a study which my associates and I reported in 1931, it was concluded that galactose after it passed the liver was practically not utilizable by any other tissue. This has received further support in a recent work of Arcq in the *Belgian Review of Medical Sciences*, in which, in dogs, he studied liver and muscle glycogen following intravenous injection and after oral administration of galactose. He found that in both instances the liver glycogen was definitely increased, while muscle glycogen was at no time enhanced. Laquer and Meyer, studying lactic acid formation by muscle suspensions, found that fructose and dextrose were converted into lactic acid quantitatively, while galactose remained unchanged. If the tissues other than the liver cannot utilize galactose as such, if they cannot convert galactose into glycogen or lactic acid, and since there is no kidney threshold for galactose, it becomes obvious that galactose is a sugar that is ideally suited for testing the carbohydrate function of the liver. This opinion has been confirmed by Frank C. Mann in his studies on dogs.

DR. NORMAN W. ELTON, Reading, Pa.: Drs. Rozendaal, Comfort and Snell used the name of Lepehne in connection with the ring test modification of the van den Bergh reaction. This modification is extremely important and is of great value in the detection of positive reactions that are entirely missed by the ordinary technic. I wish to suggest that the name of Lepehne be deleted from the terminology of the ring test, for in his original and only communication in which the method is mentioned he states that in his experience it afforded no advantage over the original technic in dealing with serums of low bilirubin content, that it was not essential with serums of high bilirubin content, and that he had discontinued its use. The true value of the ring test was not appreciated by Lepehne, and this modification should be known simply as the "ring test," as advocated by Magath.

DR. FRANK SMITHIES, Chicago: Regarding the paper of Drs. Mann and Bollman, I think that it has been proved that when the common operative treatment for peptic ulcer consisted in nothing more than a gastrojejunostomy, the greatest number of gastrojejunal ulcers was experienced largely because of the reflux of bile and pancreatic juice over the anastomosis. Since plastic or local operations on the ulcers have been performed, gastrojejunal ulcers have been less frequent. In the paper of Drs. Rozendaal, Comfort and Snell, ancient wisdom is emphasized; namely, people for two or three centuries have considered themselves "bilious" when the liver function was inefficient. Recent special tests have proved the correctness of their views. I wish to ask the following questions: In this group of patients were any observations made with regard to gastric secretory function following full meals, with or without stimuli? It appears to me that there is much significance in the relationships between velocity and quantity of the gastric and pancreatic secretion and the biliary tract secretion. Have any continuous observations been made on the same patients over a long period of time in order to observe what happens: to note what may be the variation in such individuals in relationship to health or to dysfunction? With regard to urobilinogen and urobilin, in pernicious anemia, in 103 cases of pernicious anemia I found that at some time ninety-one of the patients showed such evidences of hemolysis and that 43 per cent showed it constantly. There is a response varying with the clinical remissions and recrudescences of the disorder in the qualitative and even the quantitative evidences of hemolysis, clinical or from the laboratory side. Twenty-two years ago I reported a group of cases which I called "cachexias of malnutrition," and in that group I fed the patients amino acids and bile at first recovered from human beings and then later the amino acids artificially produced. This procedure was followed by rather striking clinical improvement. Practically all these patients were what were known as chronic "bilious" or liver cases.

DR. FRANK S. PERKIN, Detroit: I should like to substantiate the remarks of Drs. Rozendaal, Comfort and Snell in regard to a wider use of the serum bilirubin test and its clinical applications. Some eight years ago I became particularly interested in the fact that my normals were constant and that the range of normal was exceedingly small. An occasional individual in any series of normals would appear with a comparatively high reading. These were sometimes unexplainable. In other cases there were suggestive clues to previous liver damage; however, these cases were rare. Consequently, it was felt that rises above the normal level were exceedingly significant. Various clinical applications were suggested. Apparently the test has fallen into disuse in many centers, probably because too wide inferences were drawn and too much information was sought. It has definite clinical applications which are very valuable; for instance, in foretelling toxic damage to the liver in the use of the various drugs, particularly of arsenic, in advance of any clinical evidence. Its routine use in cases in which large amounts of arsenic are being given is very valuable. Its use is also valuable when it is felt that cinchophen should be used. Here one can tell early liver damage. Rises in slight degrees from the normal have been seen in anemias, and it afforded a method of differentiation between a primary and a secondary anemia. Its use has likewise been suggested in lead poisoning.

DR. F. C. MANN, Rochester, Minn.: To answer the questions, we do administer fluids, but I can't answer the question whether or not they increase the elimination of bile salts.

DR. DAVID H. ROSENBERG, Chicago: Dr. Shay was the first in this country to call attention to the value of the galactose test in the diagnosis of painless jaundice. The appearance of positive galactose tests in cirrhosis seems to depend on the degree of balance that obtains between the amount of regeneration and the amount of destruction in the liver parenchyma. Dr. Rowland suggested passing a duodenal tube in order to note the presence of bile in the duodenum. It is much simpler and easier to perform a urobilinogen test on the urine, for the discomfort of intubation of an anxious, excitable patient is thus avoided and a fluoroscopic examination, to determine whether or not the tube has entered the duodenum, becomes unnecessary. The use of the duodenal tube might well be restricted to those cases in which urobilinogen is constantly absent. The blood galactose test, discussed by Dr. Jankelson, is technically much more complex than either the urinary galactose or the urobilinogen test; it cannot be performed in the office and, although perhaps more accurate than the urinary galactose test as an index of liver function, seems to possess no practical advantage over the latter in differentiating these two types of jaundice.

DR. M. W. COMFORT, Rochester, Minn.: Mild hepatic dysfunction has been recognized for many years. Many patients continue to assert that they are "bilious" in spite of the current disrepute in which this term is held by members of the medical profession. The quantitative estimation of the serum bilirubin demonstrates that a mild hepatic dysfunction at times may actually exist in such cases. I am glad to know that Dr. Rowland has likewise encountered such patients. Dr. Smithies' questions are pertinent. Observations on the relationship between velocity and quantity of gastric, pancreatic and biliary secretions should be, but so far as I am aware have not yet been, made. Gilbert and his associates thought that patients who had bilirubin present in the serum in a quantity above normal were susceptible to many diseases. So far we have no evidence that they are especially prone to have diseases other than cholelithiasis and cholecystitis. Both the congenital and acquired types are compatible with health.

Discovery of Reflex Action.—In 1784 a professor of anatomy in Moravia wrote a very short account of the nervous system, and in attempting to explain how it worked said that "physical and mental stimuli acting upon ascending nerves are conveyed directly through the ganglia and network of nerve threads, to be reflected thence by means of descending nerves with a result in action." This wonderful discovery in thought of reflex action, arrived at so far as we know without definite experiment, is the foundation of most of what we now know concerning the way in which the nervous system works.—Collier, James: The Harveian Oration on "Inventions and the Outlook in Neurology," *Brit. M. J.* **2**:707 (Oct. 20) 1934.

NONUNION IN FRACTURE OF THE SHAFT OF THE HUMERUS

REPORT OF FIVE CASES

JAMES WARREN SEVER, M.D.
BOSTON

It is common knowledge that delayed union and nonunion occur more often in the shaft of the humerus, after fracture, than in any other long bone. This statement is, I believe, true only of fractures occurring in the middle third of the shaft, and transverse in direction. Spiral fractures that involve this region may be slow to unite, but so far I have known of no nonunions, or pseudo-arthroses. Of the following cases, three occurred in my practice and two are, fortunately for me, the misfortunes of others.

Case 1 is a report of historical interest in which a fracture of the humerus, with two subsequent refractures, went on to nonunion and complete absorption of the shaft.

My interest in this subject led me to the Warren Museum at the Harvard Medical School, where I found the specimen (fig. 1) as well as a picture of the patient before his death (fig. 2).

The history of the case was reported[1] first briefly in July 1838 and is as follows:

In the autumn of 1819, Mr. Brown, a worthy and industrious provision dealer in Derne St., now 36 years of age, in his 18th year, had the misfortune to have the right humerus fractured nearly in the middle. He was holding, under disadvantages, an enraged cow by the horns, and in some unexpected movement of the unruly animal, both fell, and the bone of his right arm was broken by the fall. Under the care of a judicious surgeon, a reunion was favorably going on, but before the curative process had been completed, Mr. Brown accidently had another fall, and broke open the old fracture again. A short time later he slipped on the floor and suffered a third refracture in the same place. The last accident was not more than two months after the first. Notwithstanding a most vigilant and untiring devotion to the injured limb, the divided extremities would not adhere, and to the surprise of the medical attendant, the shaft of each part of the divided bone began to diminish in size, and shorten in length. By a gradual action of the absorbents the whole of the armbone, between the shoulder

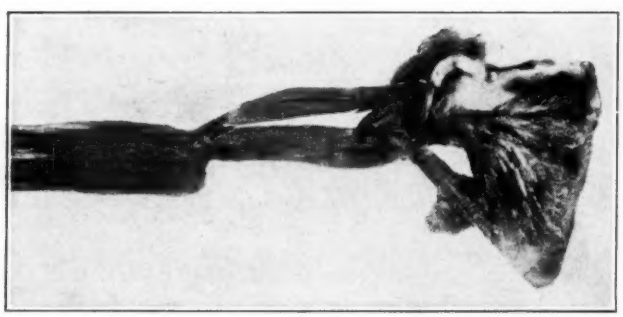


Fig. 1.—Arm of Mr. Brown (specimen in Warren Museum).

and elbow was at length completely removed, and that too without any open ulcer, so not a single vestige was left.

In spite of his having no bone in the upper arm, it was observed that this man could write, hoe, rake, cut wood and carry a pail of water. One of his amusements seems to have been to twist his arm once and a half around in one direction, then taking up a pail of water, to let it untwist, and twist once and a half around in the other direction. He could not flex the forearm on the upper arm at will, nor could he extend the forearm when flexed.

After his death in the Boston Lunatic Hospital, in February 1871, the arm was obtained and prepared by Dr. Thomas Dwight[2] of the Harvard Medical School, where it now is (figs. 1 and 2).

This case fortunately represents a unique condition, which, so far as I can find, cannot be duplicated. This

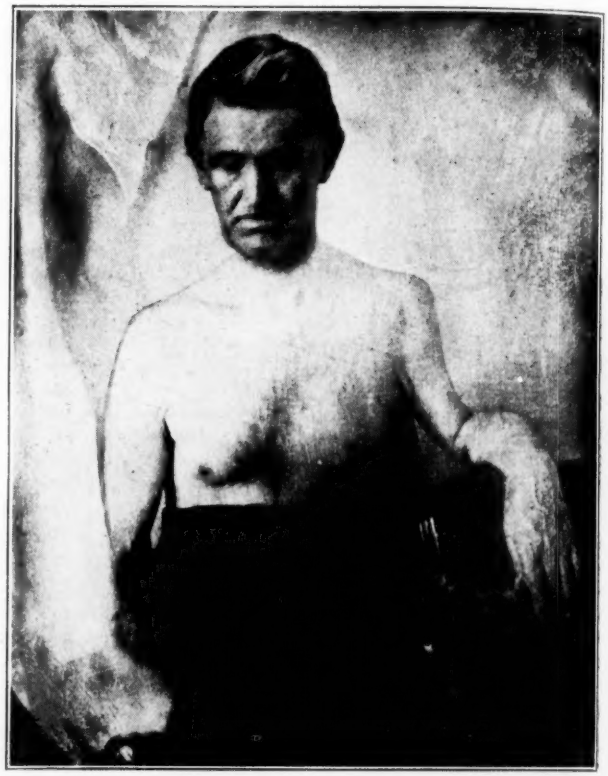


Fig. 2.—Mr. Brown (from old tintype, showing sides reversed).

complete absorption must have been due to several factors. First, nonunion due to frequent fracture and the loss of the "stimulus of incompleteness" as spoken of by Hunter. Second, marked atrophy of disuse. Third, probably vital interference with endosteal as well as with periosteal blood supply. Fourth, the fact that the man became insane, from what cause could not be determined; this may have been a factor, especially if his condition was syphilitic in origin, though I never heard of syphilis affecting bone to the extent that it caused complete absorption. Pathologically, the case remains a mystery.

Case 2.—C. L., a woman, aged 35, first broke the left humerus at the age of 17 years. This was a compound fracture. What happened after that is rather vague, but so far as I could find out the fracture was reduced, nonunion followed, and then a plate was applied. This became septic and had to be removed. Later a bone graft was applied, a graft from the tibia being used. This failed and was followed by the insertion of silver wire, which also failed. For the last ten years she has been working as a waitress and states that she can use this arm almost as well as the other.

Examination of the arm shows nonunion of the humerus, with about 2 inches (5 cm.) shortening. She can flex and extend the elbow; she can raise the arm at the shoulder but not to its full extent, and only with the upper fragment of

Read before the Section on Orthopedic Surgery at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 14, 1934.

1. Boston M. & S. J. **18:** 368 (July) 1838.

2. Dwight, Thomas: Absorption of the Humerus After Fracture, Boston M. & S. J. **10:** 245 (Oct. 10) 1872.

the humerus horizontal. At the site of nonunion there is a right angle deformity, with attempted abduction. Roentgenograms of the arm show considerable bone atrophy, marked separation of the bone ends, and various pieces of what I presume are silver wire. She is unwilling to have any further surgical efforts made in an attempt to give her a more useful arm without a written guaranty for a satisfactory result (figs. 3, 4 and 5).

Probably sepsis was the cause of the first failure. The other operations proved futile. Now, with an arm that is useful but far from perfect, she would not be taking an undue chance to have a massive onlay graft applied. The chances for a favorable result are good.

CASE 3.—J. C. W., a woman, aged 59, as the result of an automobile accident, Nov. 18, 1930, suffered a transverse fracture of the middle of the shaft of the right humerus and a comminuted fracture of the head of the left tibia into the knee joint. The fragments of the humerus, which were overriding, were readjusted under gas anesthesia and splinted in the usual way. Callus at the site of fracture of the humerus failed to form, and the patient was operated on, March 19, 1931. Fibrous tissue was found holding the ends of the bone, but no callus. A sliding graft was employed following refreshening and squaring of the bone ends. An arm and body cast was applied. The wound healed by first intention, but again bone failed to form, and another operation was performed, October 16. At this time the ends of the bone were found tapered off and lying in a thick fibrous capsule, filled with a material that resembled synovial fluid. The graft on the lower fragment had apparently united solidly but had become separated from the upper fragment. At this time a step operation was done, with considerable overlapping of the fragments, which were fastened together by chromic catgut passed through drill holes. The whole fractured area was then wrapped with a large osteoperiosteal graft from the tibia (fig. 6) and reenforced by another large osteoperiosteal graft, laid on top and held in place by circular ligatures. An arm and body cast was applied. This cast was removed December 4 and a splint applied. At this time, although the roentgenogram showed some callus, there was no union clinically. In spite of the long splinting, she again went on to complete nonunion and when last seen, in April 1934, showed considerable disability of the arm. She could not get the hand back of her head and had considerable difficulty in getting her right hand on to the left shoulder. The arm was shorter and abduction was impossible. Roentgenograms at this time showed the condition of the bone (figs. 7, 8, 9 and 10). She has refused further attempts to correct the condition.

Fig. 3 (case 2).—Appearance of patient.

I believed that this woman failed to get a satisfactory result from either operation for the following reasons: At the first operation a sliding graft was used. This may not have been from good viable bone, and the fixation of the graft and fracture may not have been rigid enough. Hence the possibility of failure. At the second operation, good bone was used. The step was cut deeply but was held only by catgut. In spite of good approximation and reenforcement by two large osteoperiosteal grafts, nonunion followed. This may have been due to poor fixation or to a cause of nonunion that mocks all theories, as some one has said.

CASE 4.—G. W., a man, aged 50, was caught by a pulley belt and twisted around a shafting several times and then dropped to the floor, March 27, 1931. He suffered a Potts' fracture of the right ankle, a comminuted fracture of the left knee joint, six fractured ribs, and a comminuted fracture of the middle of the right humerus. All this was followed by pneumonia. When I first saw him, June 4, there was no union of the humerus or of the right ankle. The humerus was operated on, June 19. Fibrous union was found, which was cleaned out, and a step approximation of the fragments was made. This step was held by four heavy kangaroo sutures passed through drill holes. An arm and body cast was applied for fixation, which he wore until about the middle of August 1931. On September 16 there was no evidence of union.

Fig. 4 (case 2).—Condition of bone, Jan. 30, 1934: arm extended.

Fig. 5 (case 2).—Condition of bone, Jan. 30, 1934: arm flexed.

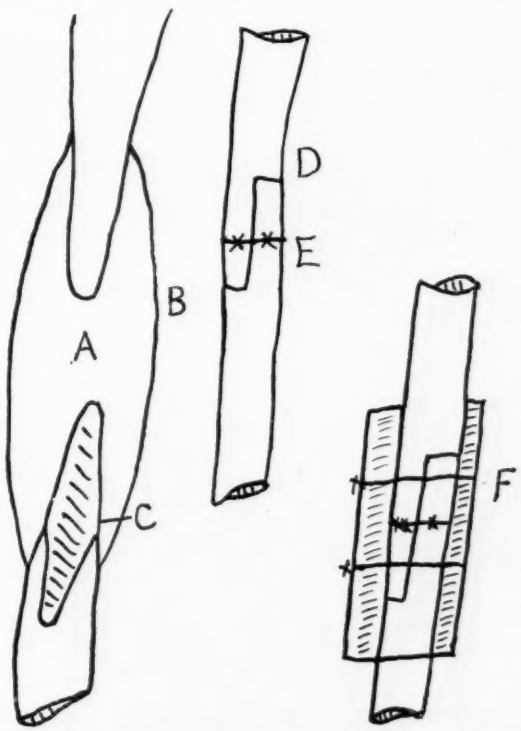


Fig. 6 (case 3).—Details of operation, Oct. 16, 1931: *A*, sac with fluid; *B*, thick fibrous tissue; *C*, old graft; *D*, lapped and counter sunk; *E*, two strands No. 3 chromic drill hole; *F*, heavy osteoperiosteal graft, wrapped about from right tibia and tied in place.

He was reoperated on, November 10. The ends of the bone were found to be surrounded by a large amount of fibrous tissue, which was removed, and the ends were refreshed. New steps were made and held by heavy chromic catgut passed through two drill holes. A beef-bone screw was also inserted for better fixation. The whole area was surrounded by a heavy osteoperiosteal graft from the tibia. The fixation was good and the ends of the bone were in good position. An arm and body spica was applied, which he wore until Jan. 31, 1932, at which time the arm seemed quite solid.

Fig. 7 (case 3).—Appearance of arm in April 1934.

April 16, he still had solid union of the arm, but on November 7 roentgenograms again showed nonunion, which was present when last seen, Jan. 8, 1934. The arm at that time was 2 inches short (figs. 11, 12 and 13).

Here is a person who suffered multiple fractures. In the literature I can find nothing but general statements in regard to the effect of trauma as a causative factor in nonunion. Just what trauma per se does to the reparative ability of the periosteum or endosteum is apparently not known. Multiple fractures must seriously deplete or impair the ability of the bodily chemistry to produce enough new bone at various places when there is such an extra demand.

Fig. 8 (case 3).—Condition of bone, Nov. 18, 1930.

As a result of the fracture of the ankle, there was nonunion of the internal malleolus, which later had to be pegged. I cannot account for the breaking up or gradual dissolution of the union following the second step of operation.

CASE 5.—A. H., a man, aged 20, fell from a ladder, Sept. 28, 1932, and fractured the right humerus at about the middle. The arm was set and a splint applied, which he wore for three months, without any evidence of union. During this period he had recovered from a musculospiral paralysis. I saw him first, May 16, 1933, and advised a bone graft, which was done, June 6. A large, massive graft was removed from the tibia, and countersunk into the humerus, after the ends had been freshened. The graft was held in place by four heavy chromic gut sutures, passed through drill holes. A body and arm cast was then applied, which he wore until July 29. On this date there seemed to be good union clinically and roentgenologically. When seen again, November 22, nonunion had recurred (figs. 14 and 15).

This boy did well and had apparently good union until I lost sight of him during the summer. He was in the hands, then, of a vigorous physical therapist, and probably the treatment, combined with the soft callus, resulted in fracture and absorption of the graft and failure of union. I believe that if longer fixation had been carried out, and physical therapy had been neglected, he would have gone on to firm and permanent union.

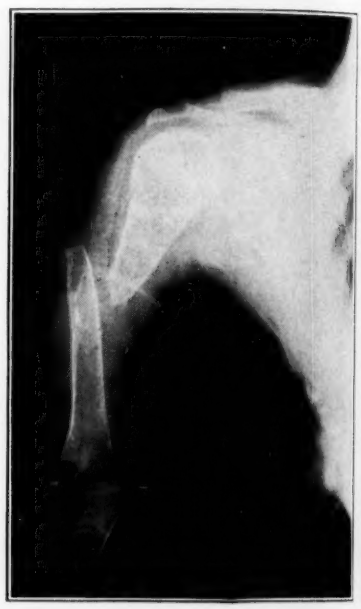


Fig. 9 (case 3).—Condition of bone, Dec. 20, 1933.

Now what do these cases prove? First, I believe that one should report failures as well as successes; and, second, I believe that there must be some intrinsic cause for nonunion in fractures of the humerus that is not wholly understood.

Trauma, from the accident itself, may so destroy the power of bone repair that union is delayed or prevented. Interference with the blood supply through the tearing of the nutrient artery may be another factor. Lack of adequate fixation, which is of the greatest importance, is another probable cause; and in the operative repair, primary internal as well as secondary external fixation is essential for a long period. However, it is practically impossible to immobilize the humerus completely in any type of external apparatus. In spite of an adequate consideration of all these factors, recurrent nonunion may, and does, occur in a certain percentage of cases.

Lack of callus formation and interposition of tissue are often factors that must be considered. The second cause is of course removed at operation, but lack of callus formation cannot be foretold. In none of these cases was there any endocrine disturbance or any abnormality in the blood chemistry. The fractures in these cases were located at about the entrance of the main nutrient artery and so may have cut off this supply.

However, as Kolodny [3] has pointed out, if the periosteal blood supply is adequate, normal union in fractures should take place, regardless of the endosteal blood supply. In these cases the endosteal supply may have been seriously impaired, but the periosteal supply seemed to be ample, except as impaired by operative procedure.

Haas [4] believes that the chief source of osteogenic cells for the repair of fractures is from the osteoblasts of the periosteum and the endosteum. The periosteum plays a relatively more active part than the endosteum. Whether direct and severe trauma, such as is suffered in modern automobile accidents, causes loss of vitality in either or both of these structures, is uncertain but may be a factor in delayed union or nonunion. In my experience with a large number of fractures of all kinds from automobile accidents, delayed union in the long bones is not uncommon and more frequent than in fractures occurring without such direct trauma.

Mock [5] states that the consensus of all investigators is that the periosteum contains the chief osteogenic ability, and that repair can be obtained more rapidly by the use of an osteoperiosteal graft than by an autogenous bone graft alone. Except in one instance, namely, in case 4, there is no evidence of any periosteal activity in the reparative process that did occur.

Fig. 10 (case 3).—Condition of bone, Dec. 20, 1933.

On the other hand, Moore and Corbett [6] believe that periosteum is not an essential element in the healing of bone, and Gallie and Robertson [7] also believe that the periosteum as such is not osteogenic and should not be depended on under any circumstances to assist in the production of new bone. They believe, however, that from a clinical standpoint its presence is of importance through its control as a limiting membrane of the circulation in a living bone.

I like to agree with the Browns [8] that the periosteum is merely a limiting membrane and a protection to a graft while circulation is being established from the living bone, and that it acts also as a protection to the process of regeneration and union between the graft and the parent bone. This is also Macewen's [9] statement, who believes that periosteum is only a limiting membrane and has no osteogenic function.

Groves [10] states that the periosteum is the product and not the mother of bone. All osteogenic properties of the periosteum, whether in repair of fractures or in grafting, are due to the presence of the outer layer of the bone cells adherent to its deep surface. Living bone is the chief source and origin of callus, which grows mainly from its outer or periosteal surface and, to a less extent, from its deep or medullary surface and its cut ends.

Fig. 11 (case 4).—Appearance of patient.

I believe that all the discussions and differences of opinion in regard to the value of the periosteum are due to the fact that some surgeons consider the periosteum, with its layer of cortical, osteogenic cells as an entity, and others speak of the periosteum without this layer. With these cortical cells it is an excellent bone producing material; without them it is merely a limiting membrane. Surgeons should decide when talking of the periosteum, as used in bone surgery, to standardize on "periosteum with."

After my experience in these cases, I have come to believe that the only operation probably worth doing is that advocated, and so well carried out, by Campbell [11] and Henderson; [12] namely, the massive or onlay graft, followed by a sufficiently long period of fixation to insure union and to carry one by the period of absorption and possible fracture of the graft. Even this operative procedure is, however, not infallible.

Fig. 12 (case 4).—Condition of bone, Feb. 3, 1932.

Fig. 13 (case 4).—Condition of bone, Feb. 5, 1934.

321 Dartmouth Street.

3. Kolodny, Anatole: The Periosteal Blood Supply and Healing of Fractures, J. Bone & Joint Surg. **5**: 698 (Oct.) 1923.
4. Haas, S. L.: The Importance of the Periosteum and the Endosteum on the Repair of Transplanted Bone, Arch. Surg. **8**: 535 (March) 1924.
5. Mock, H. E.: Periosteal Transplants in the Repair of Delayed Union, Ununited Fractures and Loss of Bone Substance, Surg., Gynec. & Obst. **46**: 641 (May) 1928.
6. Moore, J. C., and Corbett, J. F.: Function of Periosteum, Surg., Gynec. & Obst. **19**: 5 (July) 1914.
7. Gallie, W. E., and Robertson, D. E.: The Repair of Bone, Brit. J. Surg. **7**: 21 (Oct.) 1919.
8. Brown, William L., and Brown, Charles P.: Further Observations on the Fate of Free Bone Transplants, J. A. M. A. **65**: 1007 (Sept. 18) 1915.
9. Macewen, William: The Growth of Bone, 1912.
10. Groves, E. W. H.: Experimental Study of the Operative Treatment of Fractures, Brit. J. Surg. **1**: 438, 1914.
11. Campbell, Willis: The Onlay Graft in the Treatment of Ununited Fractures of the Long Bones, South. M. J. **20**: 107 (Feb.) 1927.
12. Henderson, M. S.: Autogenous Bone Transplantation, J. A. M. A. **77**: 165 (July 16) 1921.

ABSTRACT OF DISCUSSION

DR. W. BARNETT OWEN, Louisville, Ky.: Last year before this section I reported nine cases of nonunion of the shaft of the humerus. Eight of the nine cases followed primary operation. One case was treated conservatively. None of the cases reported had been considered under a two year period. I have three more cases that come under that heading that had not reached two years. I say two years because I have had some cases that appeared as if union would occur six or eight or ten months later. I find that absorption occurs and there is failure to get union. In three of the cases in which I operated, it was necessary to reoperate either because the operation was not properly done or because the vitality of the humerus was such that it did not receive the transplanted bone. In all these instances, the massive onlay graft has been used. Of twelve cases, one presented nonunion and almost complete absorption of the humerus. The other eleven cases so far have remained united. I feel that the early operation, which means trauma of a greater or lesser degree, depending on the operator and the type of operation, is a factor in nonunion. I believe that primary operation for fracture of the humerus should not be performed except for some special reason. I think the first failure, then, is due to lack of reduction and secondly to lack of adequate immobilization for a sufficient length of time. It has been my practice to apply a plaster-of-paris spica of the shoulder, the arm abducted from 90 to 120 degrees, with very little padding being used. It is difficult to immobilize the humerus for a long period. In some cases it has not been satisfactory or sufficient. Perhaps that was a factor in some of the failures. I feel that if the fracture is reduced there will be greater success. I have never seen a case of nonunion of the humerus in a young child. I have never had a failure with a case I have treated for fracture of the humerus primarily. Of all methods, the one Dr. Sever mentioned, that of Campbell and Henderson, is probably the best.

Fig. 14 (case 5).—Appearance of patient.

Fig. 15 (case 5).—Condition of bone, Nov. 21, 1933.

DR. WILLIAM SNEED, New York: I have one hospital in which for the last four years there have been sixty-two fractures of the humerus. Of those, there are only fourteen that come under the heading of oblique and transverse. Of the transverse fractures, two failed to unite; it was not possible to follow three, and two had delayed union. It is notable that a large number of the transverse fractures failed to unite or had delayed union. The average time of firm union is about six months. I wish to offer a few suggestions that I have found helpful in nonunion and delayed union. I will take, for example, the complicated, compound fractures. In one notable case the lower third of the humerus was fractured, the biceps muscle was severed and both ends of the bone protruded through into the dirt. I saw this case a month after it was reduced. Three months after there was no callus formation whatever. I offer this for what it is worth. Physical therapy was begun, a window was cut out and diathermy was applied. Calcium carbonate was injected in between the ends of the bone. Within six months there was firm union. No union whatever had resulted before. I have six cases of nonunion that I have treated by this method. By taking a large needle, forcing it in between the bones, putting in the plug and pushing out the little callus, one gets in the needle injecting calcium carbonate. This causes irritation and increases blood supply. Even in the cases in which firm bony union is not obtained, there is enough dense, fibrous union, which acts very well indeed so far as function is concerned.

JEJUNAL ULCER

ROSCOE R. GRAHAM, M.B.
AND
F. I. LEWIS, M.B.
TORONTO, ONT.

A jejunal ulcer is tragic evidence of faulty judgment in the treatment of a patient suffering from gastroduodenal ulceration.

Our remarks on jejunal ulcer are based on forty-three cases. We have ourselves operated on thirty-three patients. Included in this group were four instances of gastrojejunocolic fistula. We have studied four cases and confirmed the results roentgenographically but as yet have not operated in these cases. We have had an opportunity to study six cases treated by our associates. Five were proved by operation, and one was shown by roentgen studies. Twelve cases occurred following gastro-enterostomy that was performed by us. We have established a follow-up clinic for patients on whom we have operated for gastric or duodenal ulcer. A visit to this clinic includes a physical examination, a complete blood analysis, a fractional gastric analysis and roentgen studies. The latter is a joint examination by the clinician and the radiologist. In this series a true stomal ulcer was present in only one case; in that instance a silk suture was found at the base of the ulcer. In all the others the ulceration was truly jejunal. The ulcerative process would extend up to but not transgress the gastric mucous membrane. The ulcer, with two exceptions, was in the efferent loop of the jejunum.

We believe that the most constant etiologic factor in the formation of a jejunal ulcer is a gastroenterostomy performed on young patients who for a relatively short time have suffered from an active nonstenosing duodenal ulcer, accompanied by a high percentage of free hydrochloric acid in the gastric contents. We have noted many reports in which jejunal ulcers followed gastro-enterostomy, in which the postoperative gastric analysis showed the absence of free hydrochloric acid. We believe that, unless one controls the position of the duodenal tube by radiographic confirmation of its presence in the stomach and not in the jejunum, the results may be very inaccurate. We have done routine analyses without determining the presence of the tube in the stomach and have found no free hydro-

Read before the Section on Surgery, General and Abdominal, at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

chloric acid, but, on repeating this examination, having proved by roentgen examination that the tube was in the stomach and not in the jejunum, we have found free hydrochloric acid present in varying amounts in every patient who presented a stomal ulcer. Further, the accepted rationale of the efficacy of a gastro-enterostomy is not wholly tenable. In other words, while following this operation—theoretically the gastric acidity is decreased by the admixture of bile and pancreatic juice with the gastric contents—we have repeatedly failed to show the presence of bile in the gastric contents when we were certain that the tube was in the stomach and not in the duodenum.

Attempts to occlude the pylorus coincident with a gastro-enterostomy we believe are illogical and productive of a higher incidence of jejunal ulceration than accompanies gastro-enterostomy alone. The brilliant results of gastro-enterostomy for scar stenosis following the healing of a duodenal ulcer are due to factors incidental to the delayed emptying of the stomach: first, the atrophy of the gastric mucous membrane; second, the absence of hypermotility and hypersecretion of the stomach; third, a low incidence of free hydrochloric acid. Artificial stenosis of the pylorus does not in any way produce these secondary factors and further prevents any possible regurgitation of duodenal contents through the pylorus and, instead of an intermittent discharge of acid gastric contents into the jejunum, pours into this portion of the gastro-intestinal tract a continuous content of high acidity. That the jejunum is unable to tolerate continuously such a physiologic state has been proved irrefutably on experimental animals. We have experienced this analogy of artificial

Fig. 1 (Mrs. G.).—Gastro-enterostomy five years before. Jejunal ulcer present. Roentgen examination of a patient who harbored a jejunal ulcer, but the ulcer was not visualized with ordinary manipulation.

stenosis in five cases of transection of the stomach after the method of Devine, with the development of five jejunal ulcers in a relatively short time. Further, we believe that a reconstruction of the continuity of the tract by means of an anticolic anastomosis to which is added an entero-enterostomy predisposes to the development of jeunal ulcer.

A jejunal ulcer may present no clinical evidence of its presence until the patient suffers a serious hemorrhage or perforation or develops a gastrocolic fistula. When symptoms are present, the pain is different from the indigestion that accompanied the original ulcer. It is of a bizarre, inconstant character. It may radiate down to the pubis, to the loin, to the groin or to the testis. In fact, the clinical diagnosis in one of our cases was ureteral colic, which was excluded only after complete investigation of the urinary tract. Tenderness, when present, is usually above and to the left of the umbilicus, and often the patient complains bitterly of

Fig. 2 (Mrs. G.).—With a pressure bag, showing the visualization of the ulcer in the jejunum about three-fourths inch distal to the anastomosis.

pain in the back. The indigestion, while differing from the original disability, is in the early stages characterized by remissions, and the patient experiences relief from food or soda; but after a variable period of discomfort the symptoms become continuous and are relieved by nothing except bed rest. Thus bizarre symptoms of an indigestion in a patient who has had a gastro-enterostomy, which are relieved only by bed rest and which recur when normal activity is assumed, are highly suggestive of the presence of a jejunal ulcer. The symptoms of which these patients complain are so real and definite that the differentiation between an organic lesion and a functional gastric disturbance is not difficult. Thus, when a patient who has had a gastric operation returns with this syndrome, no effort should be spared in attempting to prove the presence or absence of an organic lesion. This is not the usual procedure. The patients are usually granted but a hasty tolerance of their recital of woe and advised to disregard the gastric distress. Unfortunately in many instances, even after the most painstaking and exhaustive investigation, it is impossible to demonstrate positively an organic lesion. This inability to demonstrate the presence of a jejunal ulcer does not exclude its presence. In the diagnosis of jejunal ulcers it is most important to realize that these ulcers may occur, as in one case proved by operation, within a month of the former operation. The longest period of good health that any patient enjoyed following a gastro-enterostomy before a proved jejunal ulcer developed was seven years.

The presence of gross or microscopic blood in the stomach contents has been an almost invariable accompaniment of jejunal ulceration in our experience. The absence of blood in the gastric contents makes the diagnosis doubtful. The presence of free hydrochloric acid in the gastric contents was demonstrated in all our cases. The presence of a tender mass at the site of the stoma, in conjunction with the foregoing symptomatology, may be regarded as pathognomonic of jejunal ulceration. There is little more than the foregoing to

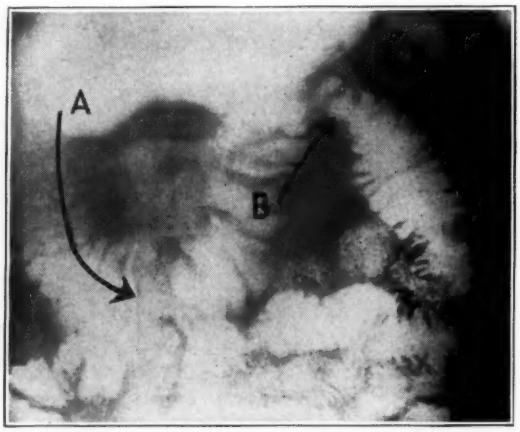


Fig. 3 (Mr. R.).—Gastro-enterostomy twenty years before; indigestion for the last nineteen years. Association of a duodenal ileus *(A)* with a jejunal ulcer *(B)*, the ileus due to obstruction of the afferent jejunal loop, due to edema and scar.

aid one in establishing the diagnosis, apart from roentgen study.

It cannot be too strongly emphasized that the roentgen examination of patients suspected of harboring a jejunal ulcer should be a combination investigation by the clinician and the radiologist. We have been impressed with the increasing instances of our ability to demonstrate the presence of jejunal ulcers when the fluoroscopic examination of the patient is undertaken by the radiologist and the clinician as a team.

In going over the histories of our early cases of jejunal ulcers proved at operation there was constantly reiterated in the operative note the fact that the distal limb of the jejunum was dilated. In our later combination studies we have found this phenomenon to be almost constantly present in patients suffering from jejunal ulceration, and indeed in some instances it has been the only positive roentgen finding. Our positive roentgen observations of jejunal ulcer are based on the presence of this dilated distal limb of the jejunum, plus a crater that can be demonstrated and filled with barium.

We have been impressed with the necessity of manipulation under the fluoroscope, in order to displace the overlying greater curvature of the stomach so as to make possible the visualization of the stoma (figs. 1 and 2). The use of the pressure bag, with the patient lying on the abdomen, has been of real value in demonstrating these ulcers. Tenderness over the stoma, we believe, is of value but must not be regarded as absolute evidence of ulcer, because we have elicited tenderness on accurate pressure over the stoma in patients who did not have jejunal ulcer. We can confirm the fact that the tender point on the abdomen corresponds accurately to the site of the ulcer; in other words, the change in level of the ulcer between the erect and the prone position is accompanied by a change in the point of maximum tenderness on the abdominal wall. The presence of a duodenal ileus resulting from stenosis of the proximal limb of the jejunum, due either to scar or edema, is of additional diagnostic value (fig. 3).

Even the most expert and careful radiologic examination fails in some instances to prove the presence of a jejunal ulcer. In one patient operation was undertaken to close an acute perforation of a jejunal ulcer. Later roentgen studies failed to reveal a crater, but subsequent operation within a short time demonstrated the presence of the ulcer. While one may often be left with indecisive evidence after careful roentgen study, we believe that, given a suggestive history of a bizarre type of indigestion, the presence of blood and free hydrochloric acid in the gastric contents, tenderness on accurate pressure over the stoma, a dilated distal limb of the jejunum in a patient who is suffering a crippling disability, we are justified in a diagnosis of jejunal ulcer, even though we cannot demonstrate a niche or crater, and we are warranted in advising a laparotomy.

In the treatment of these patients, one is astonished at the improvement in the comfort and general condition of the patient who submits to bed rest. Many of the patients who had a large, tender, palpable mass at the site of the stoma will in a few weeks be perfectly comfortable, and no mass can be palpated. In such patients with a palpable mass, or roentgen evidence of penetration of the ulcer, bed rest with dietetic control for some weeks is of the utmost value. However, the disappearance of the symptoms and the improvement in the patient's general condition should not be accepted as evidence of the cure of a jejunal ulcer. In our experience the symptoms recur invariably on return to

Fig. 4 (Miss C.).—Jejunal ulcer. Resection of jejunum and stomach. Anastomosis of stomach to descending duodenum, end to side. Displacement of duodenum to the left, with development of duodenal ileus, relieved by subsequent Polya reconstruction.

normal, active life, and this very recurrence of the symptoms under such conditions tends to confirm the clinical diagnosis of jejunal ulcer.

Therefore, a patient on whom a definite diagnosis of jejunal ulcer can be made should be not only advised but urged to submit to operative intervention at an early date. The frequency with which the transverse colon has been in intimate relation to the ulcer base has

impressed us. This relationship may in a short time progress to the formation of a gastrojejunocolic fistula.

What operative procedures are there to offer? First, the restoration of continuity of the tract by the undoing of the gastro-enterostomy and repairing the defect in the jejunum. This will be efficacious and yield brilliant results in the patients who have no demonstrable evidence of a duodenal ulcer. In three instances we have limited our operative intervention to this procedure, in the presence of a definite though apparently quiescent duodenal ulcer. In all three the clinical result has been bad, the patients suffering severely from symptoms of duodenal ulcer.

Second, the undoing of the gastro-enterostomy, the restoring of the continuity of the jejunum and then doing a local attack on the ulcer in the form of a pyloroplasty or a gastroduodenostomy. Of twenty-eight cases with primary pyloroplasty for duodenal ulcer, we have reoperated in three. In none, in subsequent roentgen studies, have we found normal gastric motion. There is a constant hyperperistalsis, and the patients have not had brilliant clinical cures. In nine cases in which gastroduodenostomy was the primary procedure, we had one fatality and four instances of stomal ulceration. These results lead us to view with some skepticism any local procedure as a means of curing duodenal ulcer.

Fig. 5 (Mr. L. M.).—Gastrojejunocolic fistula, which does not show with motor meal.

Third, plastic operations on the gastroenterostomy stoma, combined with an entero-enterostomy without excision of the stomach or jejunum. In early cases this technic has been invariably followed by disappointing results.

Fourth, undoing of the stoma, restoration of continuity of the jejunum, partial gastrectomy, and anastomosis of the stomach end-to-side of the descending limb; i. e., the second part of the duodenum. We have done four such cases and have had three instances of stomal ulceration follow and one case of severe duodenal ileus (fig. 4).

Fifth, the restoration of continuity of the jejunum, combined with a partial gastrectomy and an anterior Polya anastomosis, to which is added an enteroanastomosis. This was done in one case, with the development of an ulcer in the efferent loop of the gastrojejunostomy.

Sixth, a partial gastrectomy and resection of the jejunum and restoration of continuity of the tract by an end-to-end anastomosis of jejunum to jejunum and an end-to-end anastomosis of stomach to duodenum.

Seventh, resection of stomach and jejunum with end-to-end anastomosis of the jejunum and retrocolic Polya anastomosis of stomach to jejunum.

Either the sixth or the seventh operation corrects the physiologic fault of hypermotility and hypersecretion of the stomach and in our cases has been followed by a very marked and appreciable decrease in the hydrochloric acid content of the stomach; in fact, in most instances by a complete absence. So far we have had no recurrence following either of these procedures, which were proved by operation. One patient has had

Fig. 6 (Mr. L. M.).—Showing necessity of combining barium enema with motor meal, as the stomach is filled during administration of barium enema, the result of a gastrojejunocolic fistula.

two hemorrhages two years and two and a half years after operation. We have not had an opportunity of studying this patient, either clinically or roentgenographically since this occurred, but we are prepared

Fig. 7.—Section of stomach from region of stomal ulcer, showing marked polymorphonuclear cellular infiltration. A picture of a very definite chronic gastritis.

to believe that he may be suffering from a recurrent jejunal ulcer.

We have been impressed by the fact that the jejunal ulcer found at operation in a patient who has been given adequate preoperative treatment may be very insignificant, and for this reason we prefer, rather

than to take down the anastomosis, to resect the jejunum and stomach *en bloc* and restore continuity of the jejunum by an end-to-end anastomosis, and restore gastric continuity by a Billroth I or posterior Polya technic. In several of our cases the ulcer which was present at the time of operation was so small that evidence of its presence would have been entirely destroyed had we undone the anastomosis as a preliminary procedure. Such a procedure would destroy the irrefutable evidence of a jejunal ulcer and raise a doubt as to the wisdom of proceeding with the resection of the pyloric end of the stomach. This procedure is, in addition, not only time consuming in a necessarily long operation but adds materially to the risk of infection.

In our experience, if a pyloric resection is not done and evidence of a duodenal ulcer is present, we fail to cure our patient. During the time since we have adopted this policy, resection was done in only three of our cases on the evidence outlined in which a stomal ulcer was not found, but in these the patients' indigestion was cured. In each instance there was microscopic evidence of a well marked gastritis (fig. 7). In this series there were four cases of gastric jejunocolic fistulas. The diagnosis of such a lesion can often be made only by the giving of a barium enema. Often the barium motor meal will show no evidence of the connection with the colon (fig. 5), but after the administration of the barium enema the stomach is visualized (fig. 6). We have had one operative death. This was due to a failure on our part to recognize the fact that there could be a tremendous accumulation of content in the resected stomach, proximal jejunum and duodenum without the patient complaining of nausea or vomiting, and compatible with a normal temperature and pulse rate. In this instance the proximal jejunum and duodenum were dilated until they held more than 3 quarts (liters) of fluid, and the patient died from peritonitis as the result of a giving way of our end-to-end suture of jejunum to jejunum. Since this time we have left a duodenal tube in the stomach as a routine following gastric operations until such a time as the edema about the stoma permitted normal emptying of gastric contents. In the other three instances of gastrojejunocolic fistula we had two brilliant results, in which we did a massive resection of colon, jejunum and stomach *en bloc*, with an uneventful convalescence. In the final case we contented ourselves with undoing the anastomotic ulcer from the colon and repairing the defect in the colon. This patient recovered, but only after the development of a local peritonitis and a subphrenic abscess. We thus at the moment believe that a massive resection of stomach, jejunum and colon *en bloc* with a triple anastomosis and a cecostomy is the ideal procedure. This, if supported by combination anesthesia and blood transfusion before, during and after the operation, is not too forbidding a procedure.

CONCLUSIONS

1. A careful and exhaustive follow up of patients who have been submitted to a gastro-enterostomy shows a much higher incidence of jejunal ulceration than is usually suspected.

2. A persistent gastro-intestinal disability in a patient who has had a gastrojejunostomy demands a careful and thorough investigation.

3. Roentgen investigation of such patients is more efficient if the clinician and radiologist cooperate as a team.

4. Jejunal ulceration is a surgical lesion, and operation should be urged as soon as the patient's condition permits, provided the diagnosis is thoroughly substantiated.

5. Block resection of the stomach and jejunum, with end-to-end anastomosis of the jejunum, and either a Billroth I or retrocolic Polya reconstruction of gastric continuity is the ideal procedure.

6. A barium enema should be a routine procedure in the investigation of any patient suffering a gastro-intestinal disability after a gastro-enterostomy.

7. The ideal operation for a gastrojejunocolic fistula is a block resection of stomach, jejunum and colon, with triple anastomoses, together with a cecostomy.

170 St. George Street.

ABSTRACT OF DISCUSSION

DR. DEAN LEWIS, Baltimore: The authors have done a distinct service by indicating the necessity of cooperation between the roentgenologist, the surgeon and the internist. More information is obtained by direct examination than by questionnaires. There is a great variation in the incidence of gastrojejunal ulcer and jejunal ulcer following gastro-enterostomy. Some surgeons report 1 per cent, some 2 per cent and some 35 per cent. The only constant factor behind these figures is the surgeon. I do not know how to explain this, but experimentally one can reproduce gastrojejunal ulcer by poor suturing, and I think that has been done repeatedly at the operating table. In performing a gastro-enterostomy, I always prepare the field for the man who follows me, making it easier for him to do the second gastro-enterostomy. This is most easily done by suturing the mesocolon high up on the stomach wall so that the line of suture is immediately exposed at the second laparotomy. Some sutures are extremely bad in stomach work, and I refer particularly to the continuous mattress suture. When the continuous mattress suture is inserted, part of the stomach wall will slough. It must of necessity slough because it is strangulated. This not infrequently is the basis of gastrojejunal ulcer. I believe that the best suture for stomach work is the one devised years ago and forgotten, but recently revived. This is the suture that Billroth originally used. It is a three-layer suture and it accurately approximates the mucous membrane. With such a suture there is much less chance of loss of tissue, strangulation or subsequent death through peritonitis, and less possibility of forming a new ulcer. A year ago Dr. Gaither examined 100 cases in Baltimore, which had been accurately observed and questions carefully put, and found almost 89 per cent recoveries from gastro-enterostomy. The authors also spoke of jejunal ulcers, which develop distal to the stomach. He is perfectly right when he states that the cases with high acidity and hyperactivity of the stomach have to be carefully considered and the type of operation carefully selected. I am quite certain of one thing. I would not want the greater half of my stomach resected to cure a duodenal ulcer because it might recur in the portion left behind.

DR. ROSCOE R. GRAHAM, Toronto: I should like to stress the point that a very small number of individuals who harbor duodenal ulcers should be candidates for surgical therapy; secondly, the patient who has had a gastro-enterostomy and complains of symptoms is entitled to a thorough, painstaking investigation in which the clinician, the internist and the roentgenologist act as a team.

The Large Intestine.—In the large intestine, the digestive juices continue to act upon the remnants of the foodstuffs and a further absorption of the products of digestion takes place. The progress of the food material through the large intestine takes a comparatively long time (often eighteen hours or longer) during which there is a marked absorption of water and the residual material gradually becomes more solid.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

CALCINOSIS CIRCUMSCRIPTA

REPORT OF CASE

GALE WILSON, M.D.
SEATTLE

According to Barr,[1] " 'calcinosis' is the term used to describe a deposit of calcium in or under the skin. It has also been applied to more or less scattered deposits in the subcutaneous tissues. . . . 'Calcinosis circumscripta' is a condition in which calcification is limited to the skin. It occurs almost always in the upper extremities, especially in the fingers, and interferes little with the general health of the patient. . . . Careful history . . . usually reveals that the patients have suffered from cold hands since early childhood and that the calcium deposits have occurred gradually."

This condition was apparently first reported about 1855, and since then there have been many cases reported, all stressing to some degree the relations of the blood serum calcium and phosphorus. By far the most exhaustive study of modern times is that of Barr, whose admirable definition has been given. He lists 172 references to the literature of the past eighty years. In spite of being stressed, in none of the reported cases have the blood calcium and phosphorus values been especially indicative or abnormal, and Barr and Thannhauser [2] are in accord in discarding the idea of a generalized calcium disturbance and in considering the process to be the expression of a locally damaged tissue, especially following the nutritional defects of Raynaud's disease or scleroderma. Hence the process becomes one of dystrophic calcification.

It has been known before [3] that in addition to the local nutritional factors there are certain systemic conditions which enhance the local deposition of calcium. Among these factors may be mentioned the p_H of the blood, the action of sunlight and the ingestion of vitamin D, with the action of parathyroid extract not to be overlooked. The action of sunlight and that of vitamin D are to be especially noted here, because of the peculiar blood chemistry of the case under consideration, i. e., an unusually high blood cholesterol, which may well have been the source of a "poisoning with endogenous irradiated egosterol." [4]

REPORT OF CASE

History.—Mrs. J. F. B., aged 63, seen, Dec. 19, 1932, had always been well and healthy. About ten years before, while living in Seattle, she began to notice occasional spells of blanching and numbness of the fingers of both hands, the attack lasting three or four hours from beginning to end. She consulted a physician, who told her that she had Raynaud's disease and that nothing could be done about it. About three years later the intermittent claudication disappeared spontaneously and for a period of about two years she had no further trouble with her hands. About five years before I saw her (also about five years after the claudication first began) she noticed a slowly increasing swelling of the tips of the right thumb and forefinger. This swelling had persisted without remission for the past five years, getting rather more painful the more she used her hands, but unaffected by the ordinary ranges of temperature. During unusually cold weather the finger tips got bluish and somewhat numb, but not as much so as they did ten years before. About six months after the first swelling of the thumb several small, pinhead-like white spots appeared on the flexor surface of the distal joint of the right thumb. These spots were not tender except on deep pressure, slowly enlarged until about 3 mm. in diameter, and then came to the surface and were dischargd, either spontaneously or after the overlying skin, which had thinned out to tissue paper thickness, had been pricked. The discharged material was chalky, gritty to the touch, and sometimes thinner and more purulent appearing than at other times. Healing always took place within a few days.

About four years before I saw her the left thumb and forefinger became similarly involved, but the nodules had never been as numerous or expelled so rapidly as on the right hand, where one or more spots would mature and be expelled every two or three weeks. Within the past year and a half the middle fingers of each hand had shown a few similar spots.

The past history was negative for any serious illness. The family history was entirely negative, especially for gouty or other metabolic diseases. The patient had been married for forty years and had two grown children.

Examination.—At the time of the first visit the patient was a well developed and nourished woman. She looked considerably younger than her given age of 63. She was rather nervous, intelligent and cooperative. The head, neck, eyes, ears, mouth and throat were normal. There were no tophi or abnormal deposits. The chest was rather flattened anteroposteriorly. The breasts were atrophic. The heart was normal in size, rate and rhythm. There were no murmurs. The pulse was 88. The blood pressure was 110 systolic, 80 diastolic. The abdomen was normal. The hips and thighs were unusually wide in proportion to the general build, and there was a very suggestive deposit of fat over the outer surface of the thigh, almost amounting to a true "breeches." The ankle and foot were disproportionately small. There were slight hypertrophic changes in the patella. The hands showed clubbing of the tips of the thumbs and forefingers, with all the other fingers tapering normally. Both thumbs and both forefingers were about one fourth larger than the other fingers, and each presented from the distal interphalangeal crease to the tip from a half dozen to twenty hard, grayish white, pearly bodies, varying in size from the head of a small pin to 4 mm., all apparently lying within the skin itself, the smaller ones being the most deeply placed. There was no elevation of the nodules, the skin over the largest ones being reduced to tissue paper thinness. On squeezing the right thumb between one's fingers there was a gritty sensation exactly like that felt on squeezing a tightly filled sand bag.

The laboratory report at the time of the first visit was not remarkable: hemoglobin, 69 per cent; red blood cells, 3,840,000; white blood cells, 10,300, with a differential count of polymorphonuclears 67 per cent, lymphocytes 31 per cent and monocytes 2 per cent. The urine was entirely normal except for a slight trace of albumin. The stool was entirely normal. The basal metabolic rate was 0.

One large nodule was excised, and it was found to extend entirely through the thickness of the skin but not into the subcutaneous tissue. On section a thick, grayish white chalky material was evacuated. A smear of this material showed only a few pus cells among nontypical amorphous crystals.

Progress.—Jan. 11, 1933, a dextrose tolerance test was done and the following unusual values were obtained:

Hour	Sugar, Mg.	Calcium, Mg.	Phosphorus, Mg.	Cholesterol	Lecithin	
Fasting	85.5	9.8	3.4	411.5	0.0	
1 hour	131.6	10.9	3.0	444.5	0.0	
2 hours	117.6	10.0	2.8	444.4	0.0	Urea..... 13.2
3 hours	90.0	9.6	2.5	470.0	0.0	Uric acid 4.0
4 hours	74.1	10.0	2.6	468.0	0.0	

A roentgenogram taken of the right hand at this time showed the peculiar condition shown in figure 1.

Because of the very unusual blood chemistry as regards cholesterol and lecithin, in spite of a negative gallbladder history, an oral cholecystogram was done. There was slight filling of the gallbladder with the dye.

1. Barr, D. P.: Pathological Calcification, Physiol. Rev. **12**: 593 (Oct.) 1932.
2. Thannhauser, quoted by Barr.[1]
3. Barr, D. P.: Pathological Calcification, Washington University Clinics **27**, 1930, No. 12.
4. Shohl, A. T.; Goldblatt, Harry, and Brown, H. B.: The Pathological Effects Upon Rats of Excess Irradiated Ergosterol, J. Clin. Investigation **8**: 505 (June) 1930.

January 23 the fingers were unchanged. Another spot was breaking through on the right thumb, and incision of this spot yielded a chalky, gritty material, which was insoluble in ether, chloroform, acetone or alcohol but which did dissolve on standing over night in dilute nitric acid. Chemical analysis of the dissolved material showed the presence of calcium and phosphorus with a very small amount of organic material. The patient was empirically put on a purine-free low fat diet and

Fig. 1.—Appearance of fingers, Jan. 11, 1933: most used portions involved.

given desiccated thyroid one-half grain (0.03 Gm.) three times a day with tablets containing bile salts.

February 3 the patient felt drowsy and listless; the fingers were cold to the touch and somewhat blanched. Three days later another spot opened up and discharged, this time evacuating a cheesy material. At this later date the blood cholesterol had fallen to 220 mg. per hundred cubic centimeters, and two weeks later (February 24) it had fallen to 188 mg.

March 21 the patient returned from a two weeks' visit into central Idaho, where she encountered subzero weather and had several attacks of real claudication. On arrival here she felt better, but the fingers tended to remain cold and more spots appeared.

April 10 the blood cholesterol was down to 180 mg. and the lecithin, which could not even be detected in January, had risen to 11.6 mg. on February 7 and to 14.2 mg. in April, but the right thumb was definitely more swollen and tender, and several nodules were maturing at once.

The latter part of April the blood uric acid was 4.4 mg. per hundred cubic centimeters and the diagnosis once more leaned toward an atypical gouty condition. Under treatment with cinchophen, 10 grains (0.65 Gm.) three times a day, the uric acid was reduced to 3.6 mg. within three days, but with no change in the fingers.

May 12 another dextrose tolerance test was done, this one showing perfectly normal figures for cholesterol, lecithin, sugar, calcium, phosphorus and uric acid. The basal metabolic rate had been increased to plus 12 per cent by the thyroid.

At the conclusion of this test the patient was given 2 cc. of "Tissue Extract" (S. & D.) and promptly fainted. She recovered rapidly and returned three days later stating that she had not noticed any vasomotor effect whatever from the injection. She was given 2.5 cc. more of the tissue extract and fainted again, perspired profusely and remained listless and weak for two days, but without appreciable change in blood pressure or any sign of peripheral vasodilation.

May 24, the thyroid was increased to 2 grains (0.13 Gm.) a day. June 16 she reported for another blood check up and this time showed a cholesterol of 130 mg., calcium of 12 mg., lecithin 11 mg. and uric acid 3.9 mg. At this time parathyroid gland, one-tenth grain (0.006 Gm.) twice a day, was added to the regimen, plus an increased water intake. Also another nodule was incised, again extending down to, but not into, the subcutaneous tissue. Four days later another spot was removed from the right thumb, and in ten days there was a whitish pin-point spot in the depth of the healing scar. When this spot showed in the healing area, salicylic acid (10 per cent) in collodion was applied, only to have an adjacent, untreated area near the tip of the thumb become tender and peel off, leaving the salicylic acid treated area untouched.

July 28 the calcium had dropped to 11 mg. and the phosphorus was at its old level of 3.3 mg. per hundred cubic centimeters. August 21 the blood cholesterol was 140 mg. per hundred cubic centimeters.

COMMENT

Here was an elderly woman who had chalky deposits in the tips of the fingers she used most. She had an increased density of the costal cartilages on roentgen examination and one or two small pinheads of calcium in the heel, but was otherwise in apparently normal health. At first glance it would seem to be podagra, but the blood uric acid was not sufficiently elevated, and the "pearls" in the fingers were too opaque to x-rays, being practically as dense as the bone itself. Xanthomatosis had to be considered, but there was no demonstrable tendon involvement even with the high blood cholesterol, and no fatty substances could be detected in the material removed from the nodules themselves. The fatty deposit over the thighs and hips was suggestive of a pituitary disturbance, possibly progressive lipodystrophy, but that did not account for the blood changes or for the local deposits. The opacity of the deposits showed the presence of calcium salts, and chemically the nodules contained nothing in measurable quantity except calcium and phosphates. With a definite history of intermittent claudication of many years' duration, even with many years' remission before the local deposits were first noticed, one must admit some degree

Fig. 2.—Same hand, Jan. 11, 1934: slight increase in deposits.

of local nutritional change in the fingers; but in this particular case it would seem, in view of present knowledge of the effects of ultraviolet radiation on cholesterol and ergosterol, that the unusually high cholesterol in the blood stream could bring about an endogenous "hypervitaminosis D," which would cause the calcium to deposit in the soft tissues of the abused finger tips.

During the course of treatment the blood cholesterol has been reduced to normal, and the lecithin increased from an immeasurably small amount to normal, but there has been no improvement in the fingers other than a possible slight slowing of the rate at which the nodules mature and discharge.

Smith and Elvove,[5] experimenting with viosterol poisoning, found that a high serum phosphate with a normal or slightly increased serum calcium resulted in great calcification of the soft tissues, whereas no abnormal deposition of calcium was found when the serum phosphate values were low. The case under consideration showed serum calcium and phosphorus values that were always well within the normal limits.

Rabl[6] and Kleinmann[7] experimented with changes in the acid-base equilibrium and found marked changes in the renal excretion of calcium and phosphorus but apparently little change in the much larger quantity lost through the large bowel. In the present case I have repeatedly tried alkalinizing the patient over long periods of time and then putting on a high protein acid-forming diet, but without noticeable effect. Kleinmann has also shown that the dystrophic deposition of calcium in the tissues begins about a minute crystal of tertiary calcium phosphate, and once formed they readily extract more calcium phosphate from the blood stream (or even from the spinal fluid) and continue to grow. The real question, however, is what to do to give relief to the patient, or how to remove the deposits without removing the finger tips with them.

SUMMARY

A typical case of calcinosis circumscripta was studied, with extensive blood chemistry and clinical observations over a period of one year. The blood chemistry tends to show that the deposits of calcium phosphate in the fingers may be due to an endogenous hypervitaminosis D caused by an unusually high blood cholesterol (480 mg. per hundred cubic centimeters) superimposed on an old, remitted Raynaud's disease. All types of eliminatives have been tried, as well as changes in the acid-base ratios, high protein, low protein, fat free, purine free and other diets, all without doing other than slightly slowing up the rate of maturity of the nodules, even after the blood chemistry had been restored to normal.

509 American Bank Building.

5. Smith, M. I., and Elvove, E.: The Action of Irradiated Ergosterol in the Rabbit, Pub. Health Rep. **44**: 1245 (May 24) 1929.
6. Rabl, C. H. R.: Zum Problem der Verkalkung, Virchows Arch. f. path. Anat. **245**: 542, 1923.
7. Kleinmann, H.: Ueber die Bedingungen der Kalkablagerung in tierischen Geweben: III. Experimentelle Verkalkung durch Zufuhrung von Kalksalzen, Biochem. Ztschr. **196**: 161, 1928; Untersuchungen über die Begingungen der Kalkablagerung in tierischen Geweben, Virchows Arch. f. path. Anat. **268**: 686, 1928.

The First Five Weeks of Development.—In the first five weeks of human development, changes take place very rapidly. In that short time the fertilized ovum passes from the condition of a single cell with a diameter of about 1/200 of an inch to a fully formed human embryo about 1/5 of an inch in length (5 mm.), and contained within a spherical envelope of embryonal membranes which measures nearly an inch in diameter. By the end of the fifth week the beginnings of all the parts of the adult body are recognizable—the head, the trunk, the limb-buds, the primitive segments, the eyes, the nose and mouth. A section across the abdominal cavity of an embryo at this stage reveals the fact that the foundations of the genital glands are already laid, and that certain cells have been set aside for the reproduction of another generation.—Keith, Sir Arthur: Human Embryology and Morphology, Baltimore, William Wood & Co., 1933.

Clinical Notes, Suggestions and New Instruments

CONGENITAL HEART BLOCK

J. MURRAY KINSMAN, M.D., AND HARRY S. ANDREWS, M.D.
LOUISVILLE, KY.

About fifty cases of congenital heart block have been reported in the literature. Several authors have collected and analyzed the reported cases. There is some difference of opinion concerning the correctness of the diagnosis in a few of them, as in some there was no graphic proof that heart block actually existed and in others there was considerable doubt that it was congenital and not acquired. The heart rate of an infant is normally very rapid, and in the presence of a partial block or even of a complete block the rate, though relatively slow in comparison with the normal for the age, may still be faster than the normal rate for adults. Hence the presence of an interference with conduction may easily be overlooked. Until recently, when medical men began to become aware of its possibility, it was rare that any abnormality of this nature was discovered within the first few weeks or months of life, and sometimes years elapsed before the condition was recognized. When there is no record of the heart rate in early life, one must rely on a history of fainting spells or attacks of blueness or of dyspnea occurring at an early age before any rheumatic or diphtheritic infections have occurred.

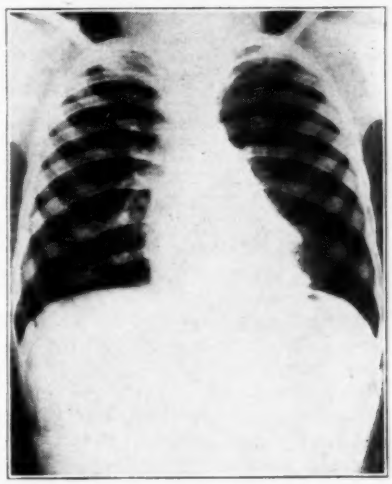


Fig. 1.—Outline of heart, July 6, 1934, at a distance of 7 feet, with the patient standing, showing a prominence in the region of the left auricle or slightly above in the pulmonary region. Measurements are: distance to right border, 3 cm.; to left border, 7.1 cm.; total transverse diameter of heart, 10.1 cm.; maximum internal diameter of chest, 21.5 cm.

The commonest associated anatomic diagnosis is a defect in the interventricular septum. In those cases which have come to autopsy and in which serial sections of the conducting system have been made, it has been found that the auriculoventricular bundle usually ends in a band of fibrous tissue situated about the septal defect. Yater, Lyon and McNabb[1] in 1933 reviewed the literature up to that time, and in 1934 Yater, Leaman and Cornell[2] analyzed those cases in which serial sections of the conducting system had been made at autopsy.

We present here another case in which the diagnosis of heart block is certain and undoubtedly congenital in origin and which is associated with a structural lesion in the heart, probably congenital.

REPORT OF CASE

History.—A boy, born in 1927, was admitted to the Louisville City Hospital on Oct. 13, 1932, being referred by the tuberculosis clinic because the mother stated that the child had had attacks of dyspnea and cyanosis since he was an infant.

He was the third child, the previous two being normal, but a subsequent baby was found dead in its crib at the age of 2 months. The mother had constant hemorrhages during the last month of pregnancy, but delivery was normal at full term. The baby weighed 8½ pounds (3,855 Gm.) at birth. He breathed and cried at once and was not a "blue baby." When

From the Departments of Medicine and Pediatrics of the University of Louisville School of Medicine.

1. Yater, W. M.; Lyon, J. A., and McNabb, P. E.: Congenital Heart Block, J. A. M. A. **100**: 1831 (June 10) 1933.
2. Yater, W. M.; Leaman, W. G., and Cornell, V. H.: Congenital Heart Block, J. A. M. A. **102**: 1660 (May 19) 1934.

only a few weeks of age he had a sudden attack of dyspnea and blueness. Since that time he had had similar attacks once or twice a month. During these attacks the mother could not keep him covered because he always climbed up on the pillows to get his breath. At times his mother would find him lying in bed apparently lifeless and would awaken him to make sure he was still alive. He had never played very actively but had been content to sit by and watch the other children play.

About one week before admission to the hospital and again three days later, he had an attack of fainting with loss of consciousness—the only ones in his life.

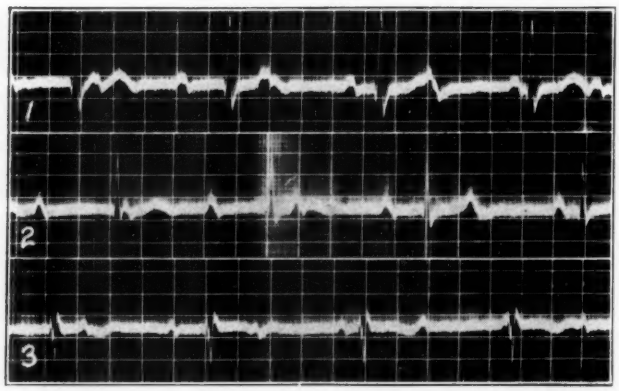


Fig. 2.—Electrocardiogram taken Oct. 14, 1932, showing complete auriculoventricular dissociation with auricular rate 109 and ventricular rate 61. Note that T_1 and T_2 are upright and T_3 inverted. There is left axis deviation.

In infancy he had whooping cough. He had colds every winter. His tonsils were removed at 2½ years of age and he had no sore throats thereafter. He had had no other infectious diseases. At the age of 2 he fell and injured his head, being unconscious for several minutes. He was admitted to the Louisville City Hospital, where no fracture of the skull was made out. About ten days later he was circumcised, with a normal convalescence.

No record of the heart rate is available until at the time of the head injury, when it was reported as "rate 45. Normal size and shape (by percussion)." However, at the time of the circumcision it was recorded as 96, and this note was made concerning examination of the heart: "Normal size, rate and rhythm; there is a harsh systolic murmur heard best over the fourth left interspace just inside the nipple line, but it is transmitted to the entire precordium.

Examination.—The boy was somewhat small for his age and rather pale, but otherwise he appeared normal. He was not dyspneic at rest, while sitting or on walking. There was no cyanosis. The blood pressure was 118 systolic, 54 diastolic. The liver was 4 cm. below the costal margin in the midclavicular line. There were no other signs of heart failure. Examination of the heart showed no thrill but rather loud sounds throughout with no especial accentuation, and a moderately loud, only slightly harsh systolic murmur, heard best just inside the nipple in the fourth interspace; it was heard also along the left border of the sternum, yet it was definitely less loud there than at the apex and it decreased in intensity as the clavicle was approached, though it could be heard over the clavicle and also at the angle of the left scapula in the back. No diastolic murmur was heard.

Roentgen examination (fig. 1) showed slight cardiac enlargement and some relative widening of the left auricle.

An electrocardiogram (fig. 2), October 14, showed complete auriculoventricular dissociation, the auricular rate being 109 and the ventricular rate 61. There was moderate left axis deviation and inversion of the T wave in lead 3; the P waves were not exaggerated.

The blood Wassermann reaction was negative. The red blood count was 4,040,000; hemoglobin, 70 per cent (Sahli); white blood count, 8,100.

During this hospital stay, the pulse varied between 48 and 82, averaging 54 to 66.

Subsequent Course.—Since October 1932 the patient has been seen several times, sometimes in the outpatient clinic, sometimes in the ward. He has meanwhile had many recurrences of the fainting spells, with loss of consciousness, dyspnea and cyanosis; the spells seem to have been induced by eating or by exertion. He has never been seen by a physician during one of these spells, but on Aug. 25, 1933, Dr. Nicholson saw him during the recovery stage of one. His report was: "Well until 8 p. m.; while going to bed he became unconscious for five or ten minutes. This attack was repeated half an hour or so later and I saw him shortly after. He was conscious but completely exhausted; the pulse was 40, full and regular. There was no cyanosis, but he was very pale and the skin was clammy and moist." He has had occasional respiratory infections, during which dyspnea and cyanosis are more easily produced. At one time the effect of atropine on the heart block was tried; after 0.5 mg. of atropine five times daily for four days, no effect on the block could be demonstrated. During the period of observation his pulse rate has remained between 48 and 70 and further electrocardiograms have shown no change in the block, complete heart block always being present. However, an interesting change in the form of the T waves did occur on one occasion. In a record made on Aug. 8, 1933, T_1, which had previously been normally upright, became quite deeply inverted, T_2 became somewhat flattened and T_3, which had always been definitely inverted, became upright and tremendously exaggerated (fig. 3). A subsequent record made Oct. 24, 1933, showed a return of the T waves to their previous levels. No known change in the patient's health occurred at this time, so that the explanation of the change must remain uncertain.

COMMENT

The diagnosis of heart block is, of course, proved. There can be little doubt that it is congenital, in view of the history dating back to a few weeks from birth, when he had attacks of blueness and dyspnea without any previous acute infections.

As to the anatomic diagnosis, there is some uncertainty. The only murmur ever heard has been systolic in time and has always had an element of harshness in it. But the place of its maximum intensity has seemed to vary from time to time. Different observers have located its maximum intensity in different places, and even the same observers have considered this location to be different at different times; sometimes it appears loudest at the apex, sometimes in the third left interspace near the sternum, and sometimes in the pulmonary region just above. Most frequently it has been thought to be loudest at the apex, and this has led us to suspect a mitral lesion, which, of course, would have to be considered acquired and not congenital. The presence of x-ray evidence of enlargement in the region of the left auricle lends weight to this interpretation. However, the enlargement is situated above the auricular area in the region of the pulmonary vessels; there is no diastolic

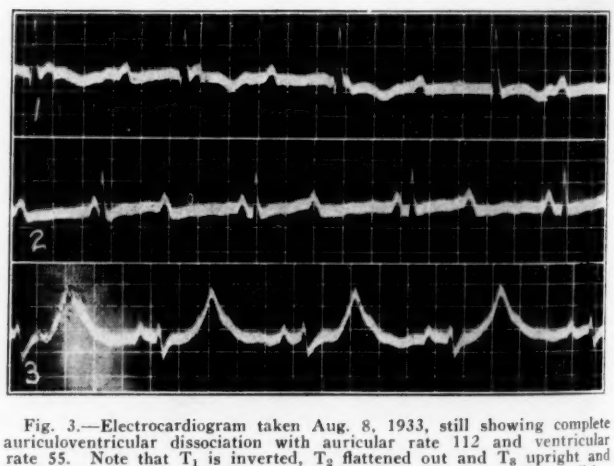


Fig. 3.—Electrocardiogram taken Aug. 8, 1933, still showing complete auriculoventricular dissociation with auricular rate 112 and ventricular rate 55. Note that T_1 is inverted, T_2 flattened out and T_3 upright and tremendously exaggerated. No known change in the patient's condition occurred at this time, and subsequent records have all been as in figure 2. Note also the tendency toward coupling of the auricular waves, a tendency suggested in figure 2 also, and even more marked in subsequent records. Note also the change in shape of the QRS complexes in Lead 3.

murmur; the electrocardiogram shows left rather than right axis deviation, and there is no accentuation of the P waves; there is no history of an acute rheumatic infection other than sore throats; and there has been no gradual development of heart failure such as one would suspect in a mitral lesion at this age. Finally, in other cases of congenital heart block the associated defect has nearly always been developmental, usually a defective intraventricular septum. For these reasons we believe that the signs are to be interpreted as those of a congenital and not an acquired lesion—probably a septal defect.

Heyburn Building.

CROCHET HOOK THROUGH BOTH ORBITS

W. L. BENEDICT, M.D., ROCHESTER, MINN.

A married woman, aged 55, a patient at the Rochester State Hospital, had made several attempts at suicide during depressive phases of a manic depressive psychosis. On April 1, 1934, she attempted to commit suicide by thrusting a number 12 crochet needle from the right temporal region through both orbits (fig. 1).

Fig. 1.—Position of crochet hook in orbits.

Fig. 2.—Side view, showing deflected point of hook.

The sharp point of the hook entered the right temple and was pushed through the left orbit until the point struck the left temporal orbital wall. She could not push the hook farther with her hand. She removed her slipper and, using the heel as a hammer, drove the hook farther into her head until the handle was entirely buried under the skin on the right temporal side. When she was discovered a few minutes later, blood was oozing from her nose and the conjunctiva of both eyes was edematous. Her vision, however, was apparently not impaired.

On examination at the hospital the pupils were active, the eyes could be rotated normally, and examination of the fundi revealed only a few retinal hemorrhages. A roentgenogram of the head disclosed that the point of the hook had been deflected sharply on the handle about half an inch from the end and was turned backward and downward into the orbit. Obviously, it was impossible to remove the hook by withdrawing it from the right side. An incision near the temporal margin of the left orbit was made and a portion of the left temporal bony wall was removed by rongeur. The needle was then grasped with strong forceps and pulled on through in the direction in which it had been started. The bone flap was then replaced, the periosteum sutured over it, and the incision in the skin closed without drainage.

The patient made an uneventful recovery without loss of vision or disturbance of ocular motility.

From the Section on Ophthalmology, the Mayo Clinic.

TESTICULAR CHORIONEPITHELIOMA WITH GYNECOMASTIA AND COMPLETE PREGNANCY REACTIONS

ROBERT M. ENTWISLE, M.D., AND JOSEPH A. HEPP, M.D., PITTSBURGH

This case is made a matter of record for the reason that it is the second reported case in which the pituitary gland in a male shows the characteristic biologic and histologic changes identical with those found in the pituitary of pregnant women.

W. E., a white man, aged 22, a student, was perfectly well until two and one-half months before entering St. Francis Hospital, Pittsburgh, or until four months before his death. The onset was about two months after a large shepherd dog playfully pawed him, causing some pain in the left side of the scrotum. The day following this there was some swelling in the scrotum and he consulted a physician concerning it. Within a week the swelling and pain had entirely disappeared, and from that time on the testicle gave him no concern, nor did he in any way connect this with his illness until it was brought out by questioning. Two months later he began to have pain in the back and abdomen; he noticed that he was losing weight, and occasionally he had a little shooting pain in the scrotum and became very nervous. During the succeeding two months he lost strength rapidly and his chief complaints were of marked muscular weakness, shortness of breath and the abdominal and back pains as noted. Three weeks before entering the hospital he noticed for the first time a fairly large abdominal mass.

The patient was emaciated and was barely able to stand without support. He walked in a marked stooped-over position. The loss of weight had been extreme, giving his eyes the appearance of exophthalmos from loss of fulness about the eye sockets. Both breasts were enlarged and tender, were slightly red, and a few drops of colostrum could be expressed from each side. There was a fairly smooth, fixed, nontender mass in the left hypochondrium, extending from the rib margin to just below the umbilicus, and from slightly to the right of the midline to the flank on the left. There was a very small, hard nontender nodule in the upper pole of the left testicle, which was about half the size of a lima bean. It was quite difficult to tell whether this was actually in the testicle or whether it was an indurated portion of the epididymis. No other masses could be palpated. There were marked secondary anemia, 1,800,000 red cells, and 31 per cent hemoglobin. The Wassermann and Kahn reactions were negative. The Aschheim-Zondek test for pregnancy was positive in four separate mice. There was no cough, but roentgen examination of the lungs revealed a widespread metastatic growth.

The testicle was removed under local anesthesia, and high voltage roentgen therapy was given to the known involved areas, none of which changed in appearance or size. He had a second positive Aschheim-Zondek test four weeks after the orchidectomy. He died five weeks after entering the hospital. Complete autopsy was done.[1] The removed testicle showed a very small tumor, which contained layers of squamous epithelium with malignant syncytial and Langhans cells, and areas suggesting fastening villi. This multiplicity of cells, we think, establishes the diagnosis of the original tumor as a teratomatous growth. The mass in the abdomen proved to be retroperitoneal glandular tissue, which was made up of syncytial and Langhans cells in typical malignant arrangement of chorionepithelioma, identical with the pathologic picture found in a like tumor of the uterus. Tumor masses were also

1. We are indebted to Dr. A. J. Bruecken of Pittsburgh for the pathologic work in this case.

found scattered throughout the lung, liver, spleen, brain, retroperitoneal nodes, kidney and suprarenal, all having exactly the same pathologic picture.

The presence of hormone from the pituitary gland was demonstrated both before the removal of the testicle and afterward by the Aschheim-Zondek test. The sections of the pituitary gland showed a large preponderance of chromphobe cells and hyperplasia of basophils and a few eosinophils. These large, clear, swollen chromphobe cells are called "cells of pregnancy." We have been able to find only one other report

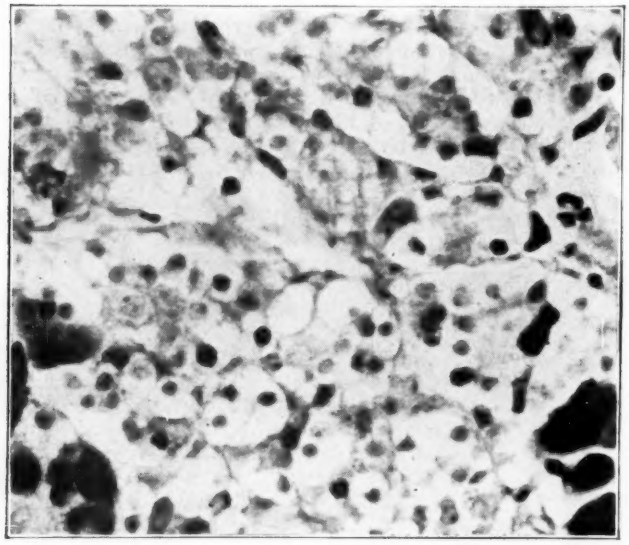


Fig. 1.—Clear cells of pregnancy in anterior lobe of hypophysis (Novak).

of such histologic changes in the pituitary gland of a male in chorionepithelioma of the testicle.

Up until June 1932, 131 cases of chorionepithelioma in the male had been reported, two of these with a positive Aschheim-Zondek test. Schlagenhaufer in 1902 was the first to recognize that certain tumors of the testicle were morphologically similar to chorionepithelioma of the uterus. He believed that they all were derived from teratomas. These tumors in the female begin from one or both of the double layer of trophoblast, composed of syncytial and Langhans cells, covering the chorionic villi and in their invasion naturally implant themselves in the uterine wall. That a teratomatous rest in the testicle

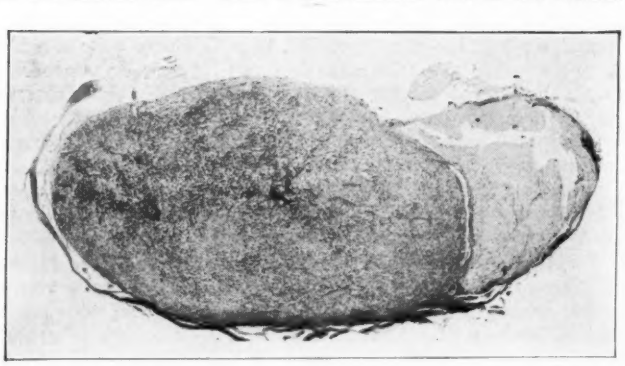


Fig. 2.—Basophilic stippling of hypophysis (R. S. Ferguson).

may contain this type of cell, which is the forerunner of the placenta, is best explained by the theory of Delafield and Prudden: "These neoplasms are described in the older textbooks under the name cystoma or adenoma but are now suspected by many to arise from dissociated blastomeres. A blastomere is one of the cells resulting from the first few divisions of the fertilized ovum. The earliest are totipotent, since any of them can produce all the tissues of the body. Hence they differ from their descendants, which become gradually multipotent or able to evolve many tissues though not all, and finally unipotent, or capable of building but one. Teratomata of the testis are believed to arise at a time when the blastomere is totipotent, and these growths are, therefore, potentially tridermal, i. e., may contain derivatives of all three germinal layers. Now, since derivatives of all three layers are potentially present in a teratoma of the testis, the tumor, like a normal embryo, will tend to develop a chorion. Thus is explained the chorionepithelioma of the testis, a malignant and rapidly metastasizing neoplasm similar to that found in the female."

It has further been suggested to the foregoing theory that this early blastomere is a fertilized cell and that subsequently through an unknown stimulus it tends to develop as an embryo with the formation of chorionic villi.

SUMMARY

1. An injury to the testicle occurred two months before the beginning of loss of weight, weakness and general pains.

2. A very small, innocent appearing tumor was produced in the testicle, with enormous metastatic growths throughout the body.

3. The breasts were lactating.

Fig. 3.—Section of tumor showing Langhans cells.

4. There was evidence of anterior pituitary activity, as proved by a positive Aschheim-Zondek test.

5. Histologic changes in the pituitary gland were identical with those in pregnant women.

It is interesting to speculate as to the part the injury by the dog had to do in the production of the condition, as the history seemed quite clear as to its connection. The mere fact that such a sequence of events is frequently shown in the wildly malignant types of tumor would lead one to believe that it is perhaps more than a coincidence.

121 University Place.

Ninety-Nine Per Cent of the Calcium.—At least 99 per cent of the calcium and over two thirds of the phosphorus which the body contains are found in chemical combination with each other in true mineral form in the bones and teeth. The small amounts of calcium and the larger amounts of phosphorus which the soft tissues and the body fluids contain are also very important to nutrition and health. As the growing body must increase not only the amounts but also the percentages of calcium and phosphorus which it contains, it needs these two elements—and particularly calcium—in relatively greater abundance in its food than any of the other body-building materials which the food supplies.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

HOWARD A. CARTER, Secretary.

NOTICES OF REACCEPTANCE

The Council on Physical Therapy has reaccepted the following products for a period of three years:

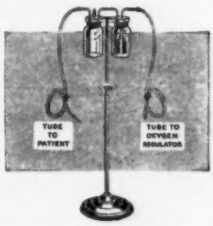
SUNLIT ULTRAVIOLET GLASS. Manufacturer: Semon Bache & Company, New York City. A window glass substitute which permits the transmission of a certain percentage of ultraviolet radiation. This product is recommended for use in solariums.

MALTESE X-RAY LEAD PLATE GLASS. Manufacturer: Semon Bache & Company, New York City. A lead glass designed for roentgen-ray protective shields.

BURDICK NASAL-CATHETER OXYGEN HUMIDIFIER ACCEPTABLE

The Burdick Nasal-Catheter Oxygen Humidifier is manufactured by the Burdick Corporation, Milton, Wis.

The purpose of this instrument is to add moisture to oxygen while the patient is receiving oxygen therapy through a nasal catheter. This form of treatment is indicated in cases of pneumonia, pulmonary edema, shock following major surgical procedures, postoperative pneumonia, angina pectoris, asthma, and other conditions in which anoxemia or cyanosis is present. The nasal catheter method of administering oxygen is simple and effective. According to the firm, oxygen consumption of from 5 to 8 liters per minute will maintain an oxygen concentration at the glottis of from 50 to 60 per cent.



Burdick Nasal-Catheter Oxygen Humidifier.

In the nasal catheter method it is extremely important clinically to have the oxygen well humidified for the patient's throat when from 10 to 15 liters per minute is flowing.

The Nasal-Catheter Unit consists of a rubber hose connecting the oxygen regulating unit with the humidifier, a humidifier consisting of a wash bottle containing water, and the combined humidifier and oxygen liter flow indicator, a wash bottle acting as a trap, catching any excess moisture that may be carried over from the first bottle, and a safety valve to relieve excessive pressure on the outfit if catheter or hose connections become kinked or plugged up.

This unit was tested in a laboratory and clinic acceptable to the Council and was declared efficient. At a flow of 5 liters per minute the Burdick Humidifier put 232 mmg. of moisture into each liter of oxygen, at 10 liters 227 mmg., and at 15 liters 216 mmg.

The Burdick Nasal-Catheter Oxygen Humidifier, therefore, is included in the Council's list of accepted devices.

HEIDBRINK KINET-O-METER ACCEPTABLE

The Heidbrink Kinet-O-Meter, a gas-oxygen anesthesia apparatus, is manufactured by the Heidbrink Company, Minneapolis.

The unit (No. 410) consists of four entirely separate and removable tank pressure regulators for controlling the contents of two tanks each of oxygen, carbon dioxide, nitrous oxide and ethylene. Each regulator is equipped with a 3,000 pound gage to register the pressure in the tanks attached thereto. Each regulator has two yokes for the accommodation of the tank valves. Each yoke is equipped with a tank stabilizer. The four separate regulators are assembled into a single unit, by means of a supporting bracket that is mounted on two posts of the stand. The regulators are connected to the operative head of the machine by means of high pressure rubber tubings.

The operative head of the machine consists of four flow meters, one each for nitrous oxide, oxygen, ethylene and carbon dioxide. These flow meters are of the kinetic type. They are actuated only by the flow of the gases. They are without internal mechanism. Registration is by means of a float and an indicating stem, the top of which indicates the amount of gases being delivered. The stem rides on top of the stream of gas. Each flow meter is calibrated in both gallons per hour and liters per minute. These calibrations differ for the different gases. Their range is as follows:

Ethylene	1 to 360 gallons per hour	1/10 to 23	liters per minute
Nitrous oxide.....	1 to 360 gallons per hour	1/10 to 23	liters per minute
Carbon dioxide...	1 to 25 gallons per hour	1/10 to 1½	liters per minute
Oxygen	1 to 240 gallons per hour	1/10 to 15	liters per minute

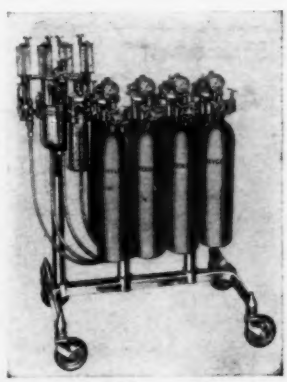
The nitrous oxide, ethylene and oxygen flow meters are equipped with direct pressure valves, by means of which large volumes of gases can be delivered instantaneously. The gases are conducted separately into each flow meter. They are there controlled by a needle valve mounted on top of the flow meter. Manifolds connect the flow meters together and act as a channel for conducting the gases into the central chamber. There is a separate manifold for the gases under regulated delivery and for the gases controlled by the direct pressure levers.

Mounted on the front of the flow meter is a complete carbon dioxide absorber equipment of the closed cycle type. The absorber itself is adjustable so that any amount or all of the circulation can be passed through or around the soda lime. The bottom of the soda lime can is removable so that it may easily be filled and emptied when a soda lime change is required. On the exhaling valve of the absorber is a lever, which operates a cam that closes the exhalation valve, thus permitting emptying the bag without removing the inhaler from the face of the patient. It also enables the anesthetist to build up a definite pressure. The cam lever does not, however, close the valve tightly. It will open under 25 mm. of pressure and therefore acts as a safety factor.

There is an ether vaporizer mounted on the exhalation side of the absorber can. This vaporizer is compact and adjustable. It is equipped with a very dense wick to increase the amount of ether vaporization. The wick is removable for replacement, cleaning and drying. There is a refilling funnel on the top of the device so that ether may be poured in at any time without interrupting the anesthesia.

The absorber is also equipped with a 10 quart pure gum rubber bag with a chain harness. This bag can—and should—be thoroughly sterilized each time it is used. There are two corrugated inhaler tubings. The mask has an adjustable exhaling valve and a special shut-off valve, by means of which either air or the gas mixture can be delivered to the patient.

This special valve insures that at no time will the mask ever be shut off so that the patient has nothing to breathe. A retaining strap is provided, and posts for fastening this strap to the mask are mounted on the inhaler casting.



Heidbrink Kinet-O-Meter.

The operative head of the equipment is mounted on a telescopic post, which permits raising or lowering the head of the equipment to meet variations of the operating table from the horizontal position.

The entire equipment is mounted on a very stable base with four large rubber tired, ball-bearing wheels. The inhaler tube and the bag are grounded to the apparatus, and a special ground wire is provided with the machine, so that the apparatus itself can be grounded to a nearby water pipe.

A commendable feature of the Kinet-O-Meter is that the whole machine, with the exception of the soda lime tank, can be taken apart and disinfected; the tank is claimed to be so caustic that no bacteria can live in it. Especially important in this connection, the gas bag and face mask of this machine can be sterilized.

This apparatus (No. 410) was investigated in a clinic acceptable to the Council and was declared satisfactory. The adver-

tising matter for this product was reviewed and found to be in accordance with the Official Rules of the Council.

There are other models of the Kinet-O-Meter, but they are identical so far as general construction is concerned. They differ in size and capacity only.

The Heidbrink Kinet-O-Meter, therefore, is included in the Council's list of accepted devices.

VICTOR MICRO-SURGICAL DIATHERMY UNIT ACCEPTABLE

Manufacturer: The General Electric X-Ray Corporation, Chicago.

This small diathermy unit (fig. 1) is intended for surgical use only. It is designed primarily for electric coagulation and electric desiccation but can also be used by certain specialists for straight diathermy to some parts of the body, such as the head, sinuses, ears and eyes, whenever such treatment is indicated.

Fig. 1.—Victor Micro-Surgical Diathermy Unit.

This machine was investigated in a physical laboratory acceptable to the Council, which reported that it was well constructed and that the various parts were found to be firmly clamped together and assembled on an iron frame. The insulation of the wires, spark gaps, containers, and so on appeared to be satisfactory. Since the machine is designed for surgical use and will probably be used intermittently only, no temperature tests were made on the transformer. Two spark gaps have an arbitrary scale, making it possible to reproduce settings of the gap distances. In a test using salt solutions of various concentrations for a load, it was found that when the output current was about 1,500 milliamperes the power input was 142 watts. Figure 2 is a schematic diagram of the circuit.

VICTOR MICRO-SURGICAL DIATHERMY UNIT

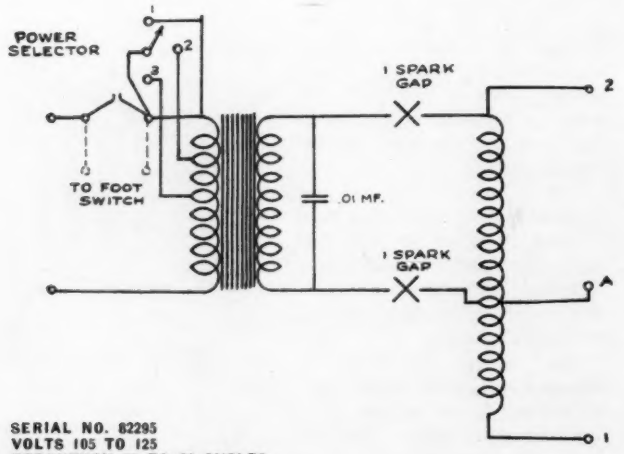


Fig. 2.—Schematic diagram of circuit.

This unit was tried out in a clinic acceptable to the Council, and the investigator reported that the machine gave satisfactory and efficient service and that the claims recorded in the advertising matter were justifiable.

The Council on Physical Therapy therefore includes the Micro-Surgical Diathermy Unit in the list of accepted devices for physical therapy.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

RAYMOND HERTWIG, Secretary.

ADVERTISING DEALING WITH TREATMENT OF DISEASE OR THE NUTRITION OF THE SICK, OR RECOMMENDING ANY SPECIAL TYPE OF DIET

Advertising giving detailed instruction to the public as to methods of treatment of disease, obesity or other abnormal states is unwise and undesirable. This practice promotes self diagnosis and self treatment for which the layman is not qualified by training or experience, and thereby may endanger health or life. Special purpose diets should not be recommended to the general public. Even reducing without the advice of a physician is unwise and may be dangerous. Advertising dealing with treatment of disease or the nutrition of the sick, or recommending any special type of diet should be directed exclusively to physicians and, when not a part of medical publications, should conspicuously bear the phrase "For physicians only" or its equivalent.

NOT ACCEPTABLE

BUTTER SCOTCH CANDY 1¢ CANDYSTIX

The Curtiss Candy Company, Chicago, submitted to the Committee on Foods candy sticks called "Butter Scotch Candy 1¢ Candystix" prepared from corn syrup, sweetened condensed whole milk, sucrose, sweetened condensed skim milk, coconut butter, butter, salt, butter flavor, water, glycerin, gum tragacanth, gelatin, amyl butyrate, ethyl butyrate, vanilla, butyric acid, vanillin, coumarin and caramel color.

Discussion of Name.—Butterscotch candy is a recognized confection prepared essentially from sugar, butter and molasses, and flavored with vanilla. No fat other than butter is used. Genuine butterscotch can be expected to contain from 8 to 12 per cent of butter and, of course, no coconut butter nor foreign fat nor fortification with artificial butter flavor. The composition and food values of this candy and a genuine butterscotch candy are quite different. This is an imitation butterscotch candy and should be so labeled. The name and label, therefore, are highly misleading and misinformative.

The company was advised of the recommendations of the Committee but for business reasons is not willing to change the name or label. This product therefore will not be listed among the Committee's accepted foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

MELLOW PASTEURIZED HOMOGENIZED MILK

Distributor.—Superior Dairy Company, Ann Arbor, Mich.

Description.—Bottled, pasteurized, homogenized milk.

Preparation.—Milk obtained from farms licensed by the city of Ann Arbor Department of Health and under the supervision of the state of Michigan is delivered cold to the creamery, where it is pasteurized by the holding method (61 C. for thirty minutes), homogenized and filled in bottles by the usual procedure (THE JOURNAL, Sept. 1, 1934, p. 681).

Analysis.—Standardized to contain not less than 4 per cent milk fat.

Calories.—0.7 per gram; 20 per ounce.

Claims of Distributor.—The cream does not separate. The curd formed in the stomach is softer than that formed from unhomogenized milk.

MELLOW MILK—HOMOGENIZED, PASTEURIZED

Distributor.—Affholter Brothers Creamery, Wyandotte, Mich.

Description.—Bottled, pasteurized, homogenized milk.

Preparation.—Milk obtained from farms licensed by the Wyandotte Department of Health and under the supervision of the state of Michigan is delivered cold (16 C.) to the creamery, where it is pasteurized (held at 61 C. for thirty minutes), homogenized and filled in bottles by the usual procedure (THE JOURNAL, Sept. 1, 1934, p. 681).

Analysis.—Standardized to contain not less than 3.5 per cent milk fat.

Calories.—0.7 per gram; 20 per ounce.

Claims of Distributor.—The cream does not separate. The curd formed in the stomach is softer than that from unhomogenized milk.

SUNSWEET STRAINED PRUNES FOR PRUNE WHIP

SUNSWEET WHIP-PRUNE (STRAINED) FOR PRUNE WHIP

Manufacturer.—California Prune and Apricot Growers Association, San Jose, Calif.

Description.—Strained, cooked pulp of California prunes.

Manufacture.—Dried prunes are thoroughly washed with hot water sprays, processed for three minutes in water at 100 C., surplus moisture is removed and the prunes are cooked for three hours in twice their weight of water in monel metal kettles. The prune pits are removed; the flesh is passed through a copper screen, reheated, cooked to the desired consistency, filled in cleaned glass jars while still hot, processed for thirty minutes at 88 C. and immediately cooled.

Analysis (submitted by manufacturer).—	per cent
Moisture	68.6
Total solids	31.4
Ash	0.7
Fat (ether extract)	0.1
Protein (N × 6.25)	1.0
Reducing sugars as invert sugar	20.3
Sucrose (copper reduction method)	0.0
Crude fiber	0.6
Carbohydrates other than crude fiber (by difference)	29.0

Calories.—1.2 per gram; 34 per ounce.

Claims of Manufacturer.—For all table uses; also for special diets for infants and convalescents. Promotes laxation. Only warming is required for serving.

UNSWEETENED COOKING CHOCOLATE

(1) BANCROFT
(2) KIBBE'S
(3) MANHATTAN QUALITY
(4) THAMES VALLEY
(5) WEIS

Distributors.—(1) Community Stores Company, Worcester, Mass. (2) E. S. Kibbe Company, Hartford, Conn. (3) Manhattan Products Company, St. Louis. (4) The Yantic Grain & Products Company, Norwich, Conn. (5) Weis Pure Food Stores, Sunbury, Pa.

Packer.—Moffat, Inc., Boston.

Description.—Ground cacao nibs or "chocolate liquor" in cake form. Same as Moffat Cooking Chocolate, Unsweetened (THE JOURNAL, Jan. 20, 1934, p. 213).

Claims of Manufacturer.—Conforms to the United States Department of Agriculture definition and standard.

WARRANTY SIEVED SPINACH

Manufacturer.—The Nielsen Corporation, Ltd., Oakland, Calif.

Description.—Sieved spinach prepared by efficient methods for retention in high degree of the natural mineral and vitamin values. No added sugar or salt.

Manufacture.—Fresh spinach is sorted, trimmed to remove inedible portions and washed. Excess water is drained off. The spinach is inspected, heated in a steam chamber, cut, and comminuted in a specially designed mill. The total time of comminuting and heating to 88 C. is from ten to twenty seconds. The strained pulp is sealed in enamel lined cans and is processed in retorts for the length of time and at the temperature specified by the California State Board of Health. The average time elapsing from the raw vegetable to the sealed can is three minutes. To avoid mineral and other nutrient losses, the spinach is not blanched. The spinach comes in contact with monel metal, stainless steel or nickel only.

Analysis (submitted by manufacturer).—	per cent
Moisture	93.4
Total solids	6.6
Ash	1.6
Sodium chloride	0.05
Fat (ether extract)	0.4
Protein (N × 6.25)	1.8
Reducing sugars as invert sugar	0.1
Sucrose	0.3
Crude fiber	0.4
Carbohydrates other than crude fiber (by difference)	2.4

Calories.—0.2 per gram; 6 per ounce.

Vitamins.—The method of preparation and processing insures the retention in high degree of the natural vitamin values.

Claims of Manufacturer.—Specially intended for infants, children and convalescents, and for special smooth diets. Only warming is required for serving.

HAWAIIAN FINEST QUALITY PINEAPPLE

(1) AUNT NELLIE'S CRUSHED, SLICED AND TIDBITS
(2) JOYFUL BRAND MATCHED HALVES
(3) KITCHEN QUEEN SLICED
(4) RED TURKEY BRAND FANCY QUALITY SLICED (VACUUM PACKED) AND CRUSHED AND FANCY SLICED.
(5) TOM-BOY FANCY CRUSHED AND SLICED

Distributors.—(1) and (3) Harrisburg Grocery Company, Harrisburg, Pa. (2) and (5) Krekeler Grocer Company, St. Louis. (4) J. B. Maltby, Inc., Corning, N. Y.

Packer.—Hawaiian Pineapple Company, Ltd., San Francisco.

Description.—Canned pineapple packed in concentrated pineapple juice with added sucrose. The same as Dole Hawaiian canned pineapple products (THE JOURNAL, April 8, 1933, p. 1106, and April 29, 1933, p. 1338).

SUPREME BREAD SLICED

Manufacturer.—Top-Notch Bakers, South Norwalk, Conn.

Description.—A sliced white bread made by the straight dough method (THE JOURNAL, March 12, 1932, p. 889); prepared from flour, water, sucrose, skim milk powder, vegetable shortening, salt, yeast and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate.

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(1) AUNT SALLY BRAND CRYSTAL WHITE TABLE SYRUP

(2) AUNT SALLY BRAND GOLDEN TABLE SYRUP

Distributor.—Portage Wholesale Co., Portage, Wis.

Packer.—Union Starch and Refining Co., Granite City, Ill.

Description.—(1) A table syrup; corn syrup sweetened with sucrose; flavored with vanilla. The same as Union Brand Crystal White Syrup (THE JOURNAL, Sept. 3, 1932, p. 833).

(2) A table syrup; corn syrup flavored with refiners' syrup. The same as Union Brand Golden Table Syrup (THE JOURNAL, July 23, 1932, p. 309).

Claims of Distributor.—Recommended for use as an easily digestible and readily assimilable carbohydrate supplement to milk in infant feeding and as a syrup for cooking, baking and the table.

SUN-BLEST PURE ORANGE JUICE

Distributor.—Jacobson-Shealy Co., Inc., San Francisco.

Packer.—Bireley's, Hollywood, Calif.

Description.—Flash pasteurized California Valencia orange juice retaining in large measure the original vitamin content; the same as Golden Bear California Pure Orange Juice (THE JOURNAL, Sept. 15, 1934, p. 839).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 2, 1935

SPIDER POISONING

The bite of the "black widow" spider (Latrodectus mactans) has long been recognized as poisonous to man. In spite of this recognition and of the wide distribution of the spider in the southern portion of the United States, relatively incomplete knowledge of its life history exists. Blair,[1] however, has recently reported observations based on a two year study of the spider as found in the vicinity of Tuscaloosa, Ala. It has been observed both in its natural environment and as raised in captivity.

In central Alabama the spiders are found in the angles between the roots of trees, beneath rocks, around old stumps, in holes in the ground, and around houses and outbuildings. Occasionally they have been found in dark corners such as clothes closets. In general they prefer dry, dimly lighted places. Their web is distinctive, but that spun by the male is always smaller and weaker than the web of the female. The spider is capable of going without food for more than a month with no recognizable harmful effects. The food consists of insects of various sizes, but cannibalistic tastes are also evident. The common nickname "black widow" given to the female arises from her habit of capturing and feeding on the smaller male. The actual process of impregnation has not been observed but apparently occurs in the fall or early in the spring. The life span of the female is approximately one year. If hatched early in the spring the spiderling may, if the food supply is adequate, mature by late summer, live through the winter, lay its eggs the following spring and die during the summer or fall. The life span of the male is usually less than a year.

Not content with the essentially circumstantial evidence of the poisonous nature of the bite of Latrodectus mactans to man, Blair [2] submitted himself to the bite of a mature female. The resulting severe clinical reaction may be divided, he believes, into three stages. The first, that of lymphatic absorption, begins almost immediately after the bite and lasted in his case about half an hour. The second stage, vascular dissemination, was characterized by severe muscular and abdominal pains, slowed, weak and thready pulse and lowered blood pressure. The temperature was at first lowered, then raised. The pulse rate also became rapid after a short time. This stage apparently lasts two or three hours. Finally, in the stage of elimination, there is a gradual return to normal.

The shock existing in the second stage may be severe. Blair believes that at this time measures should be adopted tending to a restoration of capillary tone and blood volume. Cardiac stimulants and large doses of alcohol are contraindicated. Morphine in high doses should for the same reason be used with caution. In his case immersion in a hot bath gave immediate and marked relief from pain. An acute nephritis may develop during the third stage, and attention should therefore be given to rest of the kidneys.

While limited in practical application to those regions where this spider is indigenous, the studies of Blair constitute a further step in the clarification of an interesting clinical entity.

1. Blair, A. W.: Life History of Lactrodectus Mactans, Arch. Int. Med. **54**: 844 (Dec.) 1934.
2. Blair, A. W.: Spider Poisoning, Arch. Int. Med. **54**: 831 (Dec.) 1934.

THE EPSTEIN STATE HEALTH INSURANCE BILL

The prevention, mitigation and cure of disease in the individual human being are essentially functions of the medical profession. The people, however, have reciprocal functions, which they must exercise for the best results. These relations, under our democratic system of government, are left largely to adjustment by the doctor and his patient. When the government has intervened, it has done so only by passing laws to regulate the practice of medicine and to protect the public health. How bad a job the government has made even of this intervention is obvious from the variety of cultists and quacks that federal and state governments have licensed to prey on the people. Seldom if ever has any state, even in a single case, made a substantial inquiry into the soundness of the dogmas underlying these cults. Certainly the records of our state governments in regulating medical practice are hardly such as to encourage their entrance into new fields of medical activity.

Recently new groups, particularly social workers, have begun to manifest an active if not revolutionary interest in the nature of medical practice. While physicians have sought to cure the ills of the body and mind of the individual, the social worker has sought to cure the ills of the family and of society as a whole. While the physician has had the background of centuries to guide him, and, under the law, must have professional education and training to fit him for his work and must demonstrate his fitness before he enters the medical field, the social worker need not qualify in any such manner. Any one without any education or training

whatever can style himself a social worker and engage in public activities. The social worker appears in the fields of health, economics, sociology and government without being profoundly learned in any of them. Few if any social workers are well grounded in all these fields, yet many speak with assumed authority in the whole field of social work. It is not surprising therefore that, among social workers, fads, fancies and ill regulated emotions should often guide their conduct. Yet this group, under a system now promoted by some of its leaders under the misleading appellation "health insurance," proposes to reorganize the whole practice of medicine in the United States and to make it a function of the government.

If the promoters of this system of so-called health insurance have their way, the doctor will be an agent, officer or employee of the government exactly as a teacher in the schools is such an employee. If he will submit to the conditions of employment laid down for him by some government officer or board, he may have his name registered on the list of doctors from which patients choose. Even this will obtain, however, only as long as the supervising officer or board is satisfied with his services. A government officer or board may direct his professional work. A government officer or board will pay him at rates fixed by it and subject to change without notice. The only personal privilege left to him will be the opportunity to defend himself against claims arising out of alleged malpractice, made by disgruntled government patients. What a chance he will have with such a setup! Of course the physician, like the teacher, will not have to enter the government service. He may, if he so elects, engage solely in private practice. His chances of success in such a venture, however, are likely to be even less than are the chances of success of the teacher who undertakes to pursue his calling privately. Eventually, like the panel practitioners of Germany, he can choose to starve either in or out of the service. Even though an employee entitled to the supposed benefits of the health insurance scheme employs and personally pays a private doctor, the government, under the proposed scheme, goes right on collecting from him money to pay for the government medical services that he does not want.

The compulsory state health insurance law proposed by Mr. Epstein of the American Association for Social Security is really an insurance bill only in name. The total losses in the group covered by the scheme are not to be distributed among those exposed to the losses in proportion to the risks. The bill would impose a special income tax on the wage of every employee within certain general classes, the amount of the tax being based on the amount of the wage and not on the medical and cash benefits proposed or on the risks to which the individual is exposed. An employee who is young, strong, in good health and in a job free from risk is to be taxed, with a few insignificant exceptions, at the same rate as are older, infirm employees in jobs that are hazardous to health. The tax on the wages of an unmarried employee is to be at the same rate as the tax on the wages of a married employee with an invalid wife and many children, although in the former case the risk is single and in the latter case it is multiple. Moreover, the price of the so-called health insurance—or, in insurance parlance, the premium—is not to be taxed wholly against the beneficiaries of the scheme; much of it is to be collected as a special excise tax from employers, who are entitled to neither cash nor medical benefits. Employers will, of course, pass on to the public the tax they will have to pay. Then the public will be taxed further to support the scheme, for a part of the cost of the insurance premiums is to be paid directly from the public treasury. To style such a system insurance is a misnomer. It approaches more closely a system of doles than a system of insurance, for the larger part of the premium is not paid by the beneficiary. It is to be paid as a gratuity, in part by his employer and in part by the general public.

Mr. Epstein's bill assumes the mental and moral incapacity of the American wage earner of today. It is the apotheosis of paternalism. If the American workman, given an adequate wage or adequate cash benefits in time of sickness, cannot be trusted to provide himself and his family with adequate medical service, he must be a different American from those who brought our nation to its present high place among civilized peoples. The Epstein bill assumes that the American worker, despite his education and training, cannot be trusted to look after himself and his family and that the government must seize a part of his wages or retain a part of the benefits to which he would otherwise be entitled and with this take care of him.

In this proposal the doctor is to be just a pawn in the hands of circumstances. The opportunities afforded to him under the Epstein bill to help shape proposed policies are negligible. From the point of view of the patient, the doctor and the public health the Epstein bill is inherently vicious, un-American and antisocial. It would inevitably defeat the very purposes it hopes to accomplish.

THE PSYCHOLOGY OF MODERNISM IN LITERATURE

The American visit of Miss Gertrude Stein has caused a new focusing of interest in the peculiar aberrations of the intellect exposed by the modern literati in some of their extraordinary performances. In an editorial entitled "Palilalia and Gertrude Stein," THE JOURNAL [1] pointed out that Miss Stein had probably been giving demonstrations of automatic writing carried on through a dissociation of personality. In a recent address, Prof. W. Langdon Brown [2] of the University of Cambridge ventures some additional suggestions as

1. Palilalia and Gertrude Stein, editorial, J. A. M. A. **103**: 1711 (Dec. 1) 1934.
2. Brown, W. L.: We Have Reason to Think, Brit. M. J. **1**: 1 (Jan. 5) 1935.

to the responsibility for modernism or even "da-da-ism" in the recent output of many modern writers. He conceives, for example, that the writings of D. H. Lawrence begin with an angry reaction against the intellect and end up in literary movements which produce what is called baby talk. He asserts, moreover, that such writing communicates little to any one who does not possess the key. The inspiration wells up from the unconsciousness or at least the subconsciousness. These, however, are not intellectual processes, because the highest level of the brain selects the sensory impressions to which it will pay attention, and reason must arrange and select the messages from the emotional levels. An artist by judicial and intellectual arrangement of his material may be able to convey the thrill of his emotions. These modernists or futurists, however, endeavor to make us absorb the crude material that arises from their accomplishments without any such artistic treatment. As memories arise they create new memories and new associations, which are in most instances quite individual to the person who experiences them. Artists who include all these extraordinary manifestations of their memories do not supply us with the key, so that for many readers they speak a quite foreign language.

As an example of the type of writing which he criticizes, Dr. Brown offers the following from a poem by T. S. Eliot:

> If it was to be a prize a surprise
> if it was to be a surprise to realise,
> if it was to be if it were to be, was it to be.
> What was it to be. It was to be what it was.
> And it was. So it was. As it was. As it is.
> As it as it is. It is and as it is and as it is.
> And so and so as it was.
> Keep it in sight alright.

Mr. Eliot has said that in poetry meaning only plays the part of the lump of meat in the turned up end of the dog-stealer's trousers and is merely necessary to focus the reader's attention until the poem grips him. Professor Brown's only comment on this poem is "Milton, thou shouldst be living at this hour. England hath need of thee."

The tendency to link words together by sound rather than by meaning is essentially infantile. One expects babies to rhyme in this manner. One expects the insane to utter every thought that comes into their minds without worrying about continuity or sustained interest. Such writing, however, belongs in the textbooks of psychiatry rather than in essentially artistic productions of the type intended by James Joyce in "Ulysses." Man developed reason and intellect in order that he might think and express himself reasonably and intellectually. The great phrases in literature that have lived and survived the passage of time are of this character. Who, one hundred years hence, will quote Eliot or Gertrude Stein as today we quote the writings of Shakespeare, Tennyson and the Bible?

Current Comment

SPECIAL COAST TO COAST BROADCAST

Under Association News in this issue is the announcement of a special broadcast by the American Medical Association, arranged in cooperation with the National Broadcasting Company, over a coast to coast network of stations. A display announcement of the same program appears in the advertising pages in this issue. Physicians are requested to make the information about this broadcast available to their patients, and particularly to apprise them of the fact that copies of the three speeches included in the broadcast will be mailed free of charge on request to the American Medical Association, the National Broadcasting Company, or the station from which the program is heard.

HAY DIETS

In a recent issue of THE JOURNAL, Dr. Martin Rehfuss[1] concluded, after a careful study of the available observations: "There is no evidence either in the literature or in my investigation to lead me to believe that proteins and carbohydrates are incompatible in the stomach. The danger of such teaching based on a lack of scientific evidence is manifest, and while it may be true that many individuals overeat and are presumably better by a reduction of carbohydrates, the unqualified acceptance of such a teaching can lead to the occurrence of serious malnutrition as well as to a lighting of tuberculosis and old infections." It is worth while to emphasize this dictum of the gastroenterologists because many purveyors of food, restaurants, department stores and others are ballyhooing the freak diets recommended by William Howard Hay,[2] who urges that starches and sugars "should not be eaten with the foods known as proteins and acid fruits." For several generations, Americans have been eating meat and potatoes and drinking milk, and have, as a result, produced some extraordinarily healthful and powerful human beings. Indeed, nature combines proteins and carbohydrates in practically all natural food substances. As is pointed out in a recent review of some of the books on the Hay diets, by Mary P. Huddleson, editor of the *Journal of the American Dietetic Association*, milk, one of nature's most perfect food substances, contains carbohydrates well balanced with protein; all vegetables, fruits and cereals contain both carbohydrates and protein. A separation of proteins and carbohydrates in the diet is actually impossible, outside of a chemical laboratory, unless one chooses to subsist largely on egg white and dextrose. Incidentally, Miss Huddleson points out that a better title for the Hay diets would be "Hay-wire diets." These diet books, in order to make the foods they recommend palatable, would torture carrots into carrot matches, splinters or horns of plenty. Hundreds of the recipes demand egg yolks, without indicating what is to happen to the rest

1. Rehfuss, M. E.: Proteins Versus the Carbohydrates: An Inquiry into Their Gastric Digestion, J. A. M. A. **103**: 1600 (Nov. 24) 1934.
2. A reprint of an article on Hay, prepared by the Bureau of Investigation and published in THE JOURNAL Feb. 25, 1933, will be sent on request.

of the egg. Simple mixtures of lettuce and other greens are promoted with such extraordinary titles as "Fountain of Youth Cocktail," "Happy Highball," "Pale Moon Cocktail," "Easter Bunny Salad," "Parcel Post Asparagus" and "Apartment Chicken." It is urged, moreover, that the use of such salads will enable the consumer to escape the devils of neurasthenia, fatigue, fears, bodily distress and depressions. The promoters of "patent medicine" did much to add to the gaiety of the nation during their heydey in the public favor, but our present "Hay day" affords one of the most amusing spectacles ever presented to medical science.

Medical Economics

OMAHA-DOUGLAS COUNTY CENTRAL HEALTH SERVICE

The Omaha-Douglas County Medical Society made an investigation of the standards of eligibility for clinic medical care. This investigation naturally extended into programs for low income groups, and the investigating committee recommended that the county medical society establish a central health service. After a study of numerous similar experiments in other localities, the following tentative plan was recommended:

1. A central directing organization, to be known as the Omaha-Douglas County Central Health Service, shall be established for the purpose of assisting low income patients to obtain health service at a cost they are able to pay.

2. The personnel of this organization shall consist of a minimum of one full time executive secretary and one field worker, both of recognized standing in the field of medical social service, with necessary clerks and office headquarters.

3. The general policies of this organization shall be determined by a board of directors constituted as follows: three physicians, two dentists, one hospital superintendent, one nurse and one pharmacist, to be appointed by their respective professional societies.

4. Direction of this central health service shall be by an executive committee of three appointed by the board of directors, two of whose members shall be physicians, each member to serve a term of three years.

5. The Omaha-Douglas County Health Council shall act as an advisory board to this central health service.

6. Patients shall be referred to the central health service only by physicians or welfare agencies of recognized standing, with preliminary medical and social survey to indicate the patient's health needs and lack of resources to provide for the total cost at regular prices.

7. The central health service shall confer with the patient so recommended, investigate further if necessary, and recommend a percentage reduction in medical fees and costs for services needed.

8. Members of the interested organizations rendering service will be expected to indicate their willingness to accept the recommendations of the central health service in percentage reduction of rates to be charged. Such charges will be billed at regular minimum rates, with the percentage discount indicated as recommended.

9. Collection of all charges shall be centralized in one office, with retention of 10 per cent by the central health service for operating expenses.

10. It shall be the obligation of the central health service to send patients who are unable to pay anything for private medical care to the teaching clinics of the city in rotation, or to the county clinic if not desired for teaching purposes. Exceptions are to be made to cases of recent private status when the attending physician makes a request to continue care of the patient without charge.

Bureau of Legal Medicine and Legislation

THE PHYSICIAN'S INCOME TAX—1935

The following instructions have been prepared by the Bureau of Legal Medicine and Legislation, of which Dr. William C. Woodward is Director:

The Revenue Act of 1934, under which federal income tax returns must be filed on or before March 15 next, effects numerous changes in the prior income tax law. No such change, however, relates to physicians as a class distinct from the main body of federal income taxpayers.

Every one who is required to make a federal income tax return must do so on or before March 15, unless an extension of time for filing his return has been granted. For cause shown, the collector of internal revenue for the district in which the taxpayer files his return may grant such an extension, on application filed with him by the taxpayer. This application must state fully the causes for the delay. Failure to make a return may subject the taxpayer to a penalty of 25 per cent of the amount of the tax due.

The normal rate of tax on residents of the United States and on all citizens of the United States regardless of their places of residence, under the Revenue Act of 1934, is 4 per cent on net income in excess of the exemptions and credits.

WHO MUST FILE RETURNS

1. Returns must be filed by every person whose gross income in 1934 was $5,000 or more, regardless of the amount of his net income and of his marital status. If the aggregate gross income of husband and wife, living together, was $5,000 or more, they must file either a joint return or separate returns, regardless of the amounts of their joint or individual net incomes.

2. If gross income was less than $5,000, a return must be filed (*a*) by every unmarried person, and by every married person not living with her husband or his wife, whose net income was $1,000 or more, and (*b*) by every married person living with her husband or his wife, whose net income was $2,500 or more. If the aggregate net income of husband and wife, living together, was $2,500 or more, each may make a return or the two may unite in a joint return.

If the status of a taxpayer, so far as it affects the personal exemption or credit for dependents, changed during the year, the personal exemption and credit must be apportioned, under rules and regulations prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury, in accordance with the number of months before and after such change. For the purpose of such apportionment a fractional part of a month should be disregarded unless it amounts to more than half a month, in which case it is to be considered as a month.

As a matter of courtesy only, blanks for returns are sent to taxpayers by the collectors of internal revenue, without request. Failure to receive a blank does not excuse any one from making a return; the taxpayer should obtain the necessary blank from the local collector of internal revenue.

The following discussion covers only matters relating specifically to physicians. Full information concerning questions of general interest may be obtained from the official return blank and from the collectors of internal revenue.

GROSS AND NET INCOMES: WHAT THEY ARE

Gross Income.—A physician's gross income is the total amount of money received by him during the year for professional services, regardless of the time when the services were rendered for which the money was paid, plus such money as he has received as profits from investments and speculation and as compensation and profits from other sources.

Net Income.—Certain professional expenses and the expenses of carrying on any enterprise in which the physician may be engaged for gain may be subtracted as "deductions" from the gross income, to determine the net income on which the tax

is to be paid. An "exemption" is allowed, the amount depending on the taxpayer's marital status during the tax year as stated above. These matters are fully covered in the instructions on the tax return blanks.

Earned Income.—In computing the normal tax, but not the surtax, there may be subtracted from net income from all sources an amount equal to 10 per cent of the earned net income, except that the amount so subtracted shall in no case exceed 10 per cent of the net income from all sources. Earned income means professional fees, salaries, and wages received as compensation for personal services, as distinguished from receipts from other sources.

The first $3,000 of a physician's net income from all sources may be regarded under the law as earned net income, whether it was or was not in fact earned within the meaning set forth in the preceding paragraph. Net income in excess of $3,000 may not be claimed as earned unless it in fact comes within that category. No physician may claim as earned net income any income in excess of $14,000.

DEDUCTIONS FOR PROFESSIONAL EXPENSES

A physician is entitled to deduct all current expenses necessary in carrying on his practice. The taxpayer should make no claim for the deduction of expenses unless he is prepared to prove the expenditure by competent evidence. So far as practicable, accurate itemized records should be kept of expenses and substantiating evidence should be carefully preserved. The following statement shows what such deductible expenses are and how they are to be computed:

Office Rent.—Office rent is deductible. If a physician rents an office for professional purposes alone, the entire rent may be deducted. If he rents a building or apartment for use as a residence as well as for office purposes, he may deduct a part of the rental fairly proportionate to the amount of space used for professional purposes. If the physician occasionally sees a patient in his dwelling house or apartment, he may not, however, deduct any part of the rent of such house or apartment as professional expense; to entitle him to such a deduction he must have an office there, with regular office hours. If a physician owns the building in which his office is located, he cannot charge himself with "rent" and deduct the amount so charged.

Office Maintenance.—Expenditures for office maintenance, as for heating, lighting, telephone service and the services of attendants, are deductible.

Supplies.—Payments for supplies for professional use are deductible. Supplies may be fairly described as articles consumed in the using; for instance, dressings, clinical thermometers, drugs and chemicals. Professional journals may be classified as supplies, and the subscription price deducted. Amounts currently expended for books, furniture and professional instruments and equipment, "the useful life of which is short," generally less than one year, may be deducted; but if such articles have a more or less permanent value, their purchase price is a capital expenditure and is not deductible.

Equipment.—Equipment comprises property of a more or less permanent nature. It may ultimately wear out, deteriorate or become obsolete, but it is not in the ordinary sense of the word "consumed in the using."

The cost of equipment, such as is described above, for professional use, cannot be deducted as expense in the year acquired. Examples of this class of property are automobiles, office furniture, medical, surgical and laboratory equipment of more or less permanent nature, and instruments and appliances constituting a part of the physician's professional outfit, to be used over a considerable period of time, generally over one year. Books of more or less permanent nature are regarded as equipment and the purchase price is therefore not deductible.

Although the cost of such equipment is not deductible in the year acquired, nevertheless it may be recovered through depreciation deductions taken year by year over its useful life, as described below.

No hard and fast rule can be laid down as to what part of the cost of equipment is deductible each year as depreciation. The amount depends to some extent on the nature of the property and on the extent and character of its use. The length of its useful life should be the primary consideration. The most that can be done is to suggest certain average or normal rates of depreciation for each of several classes of articles and to leave to the taxpayer the modification of the suggested rates as the circumstances of his particular case may dictate. As fair, normal or average rates of depreciation, the following have been suggested: automobiles, 25 per cent a year; ordinary medical libraries, x-ray equipment, physical therapy equipment, electrical sterilizers, surgical instruments and diagnostic apparatus, 10 per cent a year; office furniture, 5 per cent a year.

The principal governing the determination of all rates of depreciation is that the total amount claimed by the taxpayer as depreciation during the life of the article, plus the salvage value of the article at the end of its useful life, shall not be greater than its purchase price, or, if purchased before March 1913, either its fair market value as of that date or its original cost, whichever may be greater. The physician must in good faith use his best judgment and claim only such allowance for depreciation as the facts justify. The estimate of useful life, on which the rate of depreciation is based, should be carefully considered in his individual case.

In a Treasury Decision, approved Feb. 28, 1934, No. 4422, it is held, among other things, that

1. The cost to be recovered shall be charged off over the useful life of the property.

2. The reasonableness of any claim for depreciation shall be determined on the conditions known to exist at the end of the period for which the return was made.

3. Where the cost or other basis of the property has been recovered through depreciation or other allowances, no further deduction for depreciation shall be allowed.

4. The burden of proof will rest on the taxpayer to sustain the deduction claimed.

5. The deduction for depreciation in respect to any depreciable property for any taxable year shall be limited to such ratable amount as may reasonably be considered necessary to recover during the remaining life of the property the unrecovered cost or other basis.

Particular attention is called to the last of the foregoing provisions. If, in prior years, rates have been claimed which, if continued, will fully depreciate the cost, less salvage, before the end of its useful life, based on conditions now known, a reestimate of the remaining useful life should now be made and the portion of the cost that had not been depreciated at the beginning of the year 1934 (for a return for the year 1934) should be spread over this reestimated life.

Medical Dues.—Dues paid to societies of a strictly professional character are deductible. Dues paid to social organizations, even though their membership is limited to physicians, are personal expenses and not deductible.

Postgraduate Study.—The Commissioner of Internal Revenue holds that the expense of postgraduate study is not deductible.

Traveling Expenses.—Traveling expenses, including amounts paid for transportation, meals and lodging, necessarily incurred in professional visits to patients and in attending medical meetings for a professional purpose, are deductible.

Automobiles.—Payment for an automobile is a payment for permanent equipment and is not deductible. The cost of operation and repair, and loss through depreciation, are deductible. The cost of operation and repair includes the cost of gasoline, oil, tires, insurance, repairs, garage rental (when the garage is not owned by the physician), chauffeurs' wages, and the like.

Deductible loss through depreciation of an automobile is the actual diminution in value resulting from obsolescence and use and from accidental injury against which the physician is not insured. If depreciation is computed on the basis of the average loss during a series of years, the series must extend over the entire estimated life of the car, not merely over the period in which the car is in the possession of the present taxpayer.

If an automobile is used for professional and also for personal purposes—as when used by the physician partly for recreation, or so used by his family—only so much of the expense as arises out of the use for professional purposes may be deducted. A physician doing an exclusive office practice

and using his car merely to go to and from his office cannot deduct depreciation or operating expenses; he is regarded as using his car for his personal convenience and not as a means of gaining a livelihood.

What has been said with respect to automobiles applies with equal force to horses and vehicles and the equipment incident to their use.

MISCELLANEOUS

Laboratory Expenses.—The deductibility of the expenses of establishing and maintaining laboratories is determined by the same principles that determine the deductibility of corresponding professional expenses. Laboratory rental and the expenses of laboratory equipment and supplies and of laboratory assistants are deductible when under corresponding circumstances they would be deductible if they related to a physician's office.

Losses by Fire or Other Causes.—Loss of and damage to a physician's equipment by fire, theft or other cause, not compensated by insurance or otherwise recoverable, may be computed as a business expense and is deductible, provided evidence of such loss or damage can be produced. Such loss or damage is deductible, however, only to the extent to which it has not been made good by repair and the cost of repair claimed as a deduction.

Insurance Premiums.—Premiums paid for insurance against professional losses are deductible. This includes insurance against damages for alleged malpractice, against liability for injuries by a physician's automobile while in use for professional purposes, and against loss from theft of professional equipment and damage to or loss of professional equipment by fire or otherwise. Under professional equipment is to be included any automobile belonging to the physician and used for strictly professional purposes.

Expense in Defending Malpractice Suits.—Expenses incurred in the defense of a suit for malpractice are deductible as business expense.

Sale of Spectacles.—Oculists who furnish spectacles, etc., may charge as income money received from such sales and deduct as an expense the cost of the article sold. Entries on the physician's account books should in such cases show charges for services separate and apart from charges for spectacles, etc.

Association News

SPECIAL MEETING OF HOUSE OF DELEGATES IN CHICAGO, FEBRUARY 15

The Speaker of the House of Delegates of the American Medical Association has issued the following official call for a special session of the House of Delegates to be held in Chicago, Feb. 15, 1935:

To the Members of the House of Delegates of the American Medical Association:

In compliance with the official request of the Board of Trustees that the House of Delegates be convened in special session, I, as Speaker, under authority of chapter III, section 2, of the By-Laws, hereby officially call the House of Delegates of the American Medical Association to convene in special session in the city of Chicago, state of Illinois, at 10 a. m., Central Standard Time, on the fifteenth day of February 1935.

The business to be transacted at this special session shall be limited to the consideration of the social and economic policies of the Association as related to pending and proposed legislation, to sickness insurance and to other matters which may be submitted by the Board of Trustees.

The House shall remain in session, recessing from day to day, until its deliberations are concluded.

Signed and Issued in San Francisco, California, January 21, 1935.

FREDERICK C. WARNSHUIS, M.D.
Speaker, House of Delegates, American Medical Association.

The meetings of the House of Delegates will be held at the Palmer House. Tentative reservations have been made at the Palmer House so that all members of the House of Delegates and all officers of the Association who are required to attend may be assured of hotel accommodations. Each delegate is urgently requested to communicate with the Palmer House, Chicago, and make his own final reservation, stating the kind of accommodations desired and the time of expected arrival.

By official action of the Board of Trustees, authorization has been given for the payment of necessary travel expense incurred by delegates in attending the called session of the House of Delegates in order that a truly representative meeting may be had and that no undue burden will be imposed on any delegate.

Since matters of the utmost importance to the entire medical profession are to be considered, it is earnestly hoped that every delegate who attended the Cleveland session of the Association will be present at this special session.

Section 2, chapter III, of the By-Laws of the American Medical Association, pertaining to special sessions of the House of Delegates, is as follows:

SEC. 2. SPECIAL SESSIONS.—Special sessions of the House of Delegates shall be called by the Speaker on written request of twenty-five or more delegates representing one third or more of the constituent associations, or on request of a majority of the Board of Trustees. When a special session is thus called, the Secretary shall mail a notice to the last known address of each member of the last House of Delegates at least twenty days before such special session is to be held, in which notice shall be specified the time and place of meeting and the items of business to be considered. No other busniess shall be transacted at the special session than that specified in the call.

Each delegate who served in the House of Delegates at the Cleveland session has been notified of the called meeting to be held in Chicago on February 15, in accordance with the provisions of the By-Laws, and a copy of the official call issued by the Speaker has been mailed to all delegates, as required by the By-Laws of the American Medical Association.

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time. The next three broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

February 7. Heart Diseases.
February 14. Heart Valves.
February 21. Heart Muscles.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time. The next three broadcasts will be as follows:

February 5. Pipes and a Pump, W. W. Bauer, M.D.
February 12. Rheumatism and Gout, Morris Fishbein, M.D.
February 19. Health Lessons from George Washington, W. W. Bauer, M.D.

Special Coast to Coast Broadcast

The American Medical Association will broadcast on a special program arranged through the courtesy of the National Broadcasting Company over a network of stations, beginning at 6 p. m., eastern standard time, Monday, February 18. The program will include music and three speakers from among physicians in attendance at the Annual Congress on Medical Education and Medical Licensure, meeting in Chicago on that day. The speakers will be introduced by Dr. Morris Fishbein. The speakers and their topics are as follows:

Advancement of Medical Education, Walter L. Bierring, M.D.
The Prolongation of Life, Ray Lyman Wilbur, M.D.
The Battle Against Tuberculosis, Kendall Emerson, M.D.

The Only Proved Poisonous Spider.—In man the bite of Latrodectus mactans is followed, with dramatic suddenness, by a characteristic and alarmingly severe systemic reaction. The full grown female, particularly when distended with eggs, appears from experiments with animals to be the most poisonous. . . . The male, though also poisonous, may, on account of its size, greater timidity and scarcity, be ignored as an etiologic factor of any importance in arachnidism. . . . Latrodectus mactans is the only proved poisonous spider found in the United States.—Blair, A. W.: Life History of Latrodectus Mactans, *Arch. Int. Med.* **54**:844 (Dec.) 1934.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Bill Introduced.—H. 87 proposes to authorize the sexual sterilization of certain socially inadequate inmates of state institutions.

ARIZONA

Bill Introduced.—H. 19 proposes to enact a new pharmacy practice act. Apparently this bill proposes to prohibit physicians from dispensing drugs and medicines but permits them to administer personally "drugs and medicines carried or kept for emergencies . . . in order to supply the immediate needs of their own patients."

ARKANSAS

Bill Introduced.—S. 32 proposes to authorize the sexual sterilization of insane, idiot, imbecile, feebleminded or epileptic inmates of state institutions.

Bill Passed.—S. 35, proposing a new optometry practice act, has passed the senate. The bill proposes to permit a licensed optometrist to employ any method or means other than the use of drugs, medicines or surgery for the analysis of any optical defect, deficiency or deformity, visual or muscular anomalies of the visual system to prescribe or adopt or duplicate lenses, prisms or ocular exercises for the correction, relief or need of the visual functions, or to use scientific instruments to train the visual system.

DELAWARE

Bills Introduced.—H. 10 proposes that the property of any corporation organized for the purpose of free medical or dental aid or education shall be exempt from state, county and municipal taxes to the extent that such property is actually so used. H. 23 proposes to require that before any child shall be admitted to a public school he shall present a certificate that he has been vaccinated successfully against smallpox or a physician's certificate that vaccination is inadvisable by reason of some physical disability.

DISTRICT OF COLUMBIA

Personal.—John Barton Payne, chairman of the American Red Cross since 1921, died, January 24, of pneumonia. Judge Payne, who would have been 80 years of age on January 26, was the son of a physician, Dr. Amos Payne.

Medical Bills in Congress.—S. 1016, introduced by Senator Capper, Kansas, proposes to empower the health officer of the District of Columbia to authorize the disinterment and reinterment of bodies in cases in which death has been caused by certain contagious diseases. S. 1401, introduced by Senator Davis, Pennsylvania, and H. R. 4510, introduced by Representative Ellenbogen, Pennsylvania, propose to provide for needy blind persons of the District of Columbia.

GEORGIA

County Society Creates Lectureship.—The Fulton County Medical Society announces the establishment of the E. Bates Block Memorial Lectureship in Medicine. The lectureship was created in memory of Dr. Block by his family and will bring each year to Atlanta a prominent specialist in medicine. Dr. Foster Kennedy, New York, director of the neurologic service, Bellevue Hospital, and professor of clinical neurology at Cornell University Medical College, gave the first lecture, January 24. He discussed the relationship of neurology to medicine and the present status of psychiatry. Dr. Block, at the time of his death in October 1932, was professor of neurology and psychiatry, Emory University School of Medicine.

ILLINOIS

Bill Introduced.—H. 47 proposes to require operators of motor vehicles to pass examinations, including tests of eyesight.

INDIANA

Bill Introduced.—H. 66 proposes to create a board of chiropractic examiners and to regulate the practice of chiropractic. The only educational requirements to be exacted of an applicant for a license is a high school education or its equivalent and graduation from a chiropractic college or school after completing a course of training of at least three years of eight months each. Chiropractic is defined as "the science of locating and correcting any interference with nerve transmission and expression," but licentiates are not to be permitted to practice surgery, prescribe drugs or administer anesthetics. Licentiates are also to be permitted to use the title "Dr.," provided "such designation is used in such manner as to indicate that the licensee is a chiropractor."

IOWA

Personal.—Dr. Leonard A. West, flight surgeon in the medical reserve corps, has been appointed medical examiner for the bureau of air commerce in Des Moines.——Dr. Anton R. Schier has been named superintendent of the Hospital for Epileptics and School for Feebleminded, Woodward, succeeding the late Dr. Mathew N. Voldeng. Dr. Schier was formerly assistant superintendent of the Institution for Feebleminded Children at Glenwood.

Gavel Presented to Society.—A hand carved gavel from the island of Cavtat was presented to the Linn County Medical Society recently by Dr. Arthur W. Erskine, Cedar Rapids. On the head of the gavel there is a likeness of the staff of Aesculapius with a snake wound around it. Dr. Erskine had the gavel made from native ashwood obtained from the island, which is said to be the birthplace of Aesculapius and which in ancient times was known as Epidaurus.

MASSACHUSETTS

Bills Introduced.—H. 1105 proposes to prohibit an insurance company, if it has actual notice that an injured insured person is indebted for hospitalization made necessary as a result of personal injuries, from settling a claim for damages for such personal injuries before such indebtedness is paid. H. 1276 proposes to make it unlawful for any physician or hospital in any way to influence any person, injured by accident, in the selection or retention of any attorney to prosecute or handle his claim for damages. H. 1109 proposes to give to physicians, nurses and hospitals, treating persons injured through the negligence of others, liens on any judgment or settlements accruing to the injured persons on account of their injuries. H. 1113, apparently to supplement the workmen's compensation act, proposes that any injury or illness accruing to a workman who has been employed twenty or more years continuously by a corporation shall be deemed to be a compensable injury or illness. S. 74 proposes to authorize a divorce if either spouse has been confined in a hospital for the insane for at least five years. S. 308 proposes to authorize the establishment and maintenance, in the western part of the commonwealth, of a hospital for the treatment of cancer. S. 312, to enact a new chiropody practice act, proposes to define chiropody or podiatry as the examination, diagnosis and treatment externally by medical, mechanical or surgical means or manipulation, or by the various modalities of physical therapy, of the structures and diseases of the human foot and leg, without the use of other than local anesthetics and not including the amputation of toes or of a foot. H. 1458 proposes to create a board of magnetic healer examiners and registration and to regulate the practice of magnetic healing, which the bill defines as "the science of reviving and producing life and circulation in the nerve system and cells, so as to heal all nerve affections." Apparently, no educational requirements whatever are to be exacted of applicants for licenses to practice magnetic healing. Such applicants are to be required to "submit to an examination as to his or her qualifications for the practice of magnetic healing, which examination shall include the subject of nerves." H. 1285, to amend the workmen's compensation act, proposes that whenever an employee claims compensation for an occupational disease his claim shall be submitted by the industrial accident board to three referees, selected by the board from a list of licensed physicians skilled in the diagnosis and treatment of occupational diseases, which list is to be prepared by the board of registration in medicine. After investigation, the referees are to report their findings of medical fact to the industrial accident board. S. 268 proposes to amend the law which authorizes the department of labor and industries to require a physician, treating a patient whom he believes to be suffering from any ailment or disease contracted from any employment, to report that fact to the department, by making it mandatory for the department to pay a reporting physician 50 cents for each such report submitted and by providing that such report shall not be subject to summons nor shall its contents be made public. H. 1284, to amend the workmen's com-

pensation act, proposes, in effect, to make all occupational diseases compensable. H. 1615 proposes to accord to physicians and hospitals liens on the proceeds of any health, accident and liability insurance policy that may be due to any patient treated by the physician or hospital.

MINNESOTA

Bill Introduced.—S. 112, to amend the workmen's compensation act, proposes, in effect, to make compensable all diseases and infections naturally resulting from any employment covered by the act.

Minnesota Free of Tuberculosis in Cattle.—The *Journal-Lancet* announces that Minnesota has been designated a "cattle tuberculosis-free" state, attributing this achievement to the intensive campaign that has been carried on for the past fifteen years. The designation means that the disease is confined to less than 0.5 per cent of cattle in the state.

MISSOURI

Pathologic Society Organized.—The Kansas City Pathological Society was organized at a meeting, Dec. 12, 1934, with Dr. William K. Trimble as president and Dr. Arthur H. Wells, secretary. The society will cooperate with the Jackson County Medical Society by having its meetings the hour preceding the weekly meetings of the county organization, except for one night a month, when it will take over the regular period of the medical society meeting. The programs will be along clinical pathologic lines in an effort to attract physicians in all branches of medicine.

Bills Introduced.—H. 73 proposes to forbid the sale or other distribution of acetylsalicylic acid, carbolic acid or iodine, except on the prescription of a licensed physician, dentist or veterinarian. H. 87, to supplement the workmen's compensation act, proposes to make "occupational diseases" compensable, provided the workman has been exposed to the producing cause for at least five years, two years of which has been in Missouri. The bill proposes to define an occupational disease as any physical change or impairment in health of an employee, arising independently of any wilful negligence on his part, tending to impair, restrict or totally disable him from performing his duties, and arising from the particular product manufactured, or the means and methods of manufacture. H. 133 proposes to require that all drugs and chemicals, in whole or in part of coal tar origin, intended for human medication, shall, except when prescribed by a licensed physician, be plainly labeled with their true English names and as being of coal tar origin. Labels must include statements of the dangerous effects and give the names of at least two antidotes. H. 148 proposes to prohibit the sale or other distribution of marijuana.

MONTANA

Bill Introduced.—H. 9 proposes to amend the law relative to hospitals. The law now prohibits hospitals not held for private or corporate profit and hospitals that are institutions of purely public charity and that are exempted from any state, county or municipal tax by reason thereof from discriminating between the patients of regularly licensed physicians. The present law requires such hospitals to admit and care for the patients of any regularly licensed physician. This bill proposes to require such hospitals to admit and care for the patients of "any reputable regularly licensed physician and practitioner of the healing art." It defines "practitioner of the healing art" as any person . . . licensed by the state of Montana to practice osteopathy, chiropractic, or any science recognized by the laws of the state of Montana." The present law imposes a fine of from $500 to $1,000 on any person, corporation or association who violates it "with intent to injure any patient or to injure the practice of any physician or surgeon." The proposed amendment would impose this fine regardless of intent.

NEW MEXICO

Bill Passed.—H. 16 has passed the house, proposing to authorize all cities, towns and villages operating under special acts of the legislature to maintain hospitals, sanatoriums and other institutions for the care and maintenance of sick or indigent persons.

NEW YORK

Health Unit Disapproved.—The Fulton County Medical Society at its annual meeting in Gloversville, Dec. 20, 1934, adopted a resolution registering its disapproval of a bi-county health unit for Fulton and Montgomery counties. It was said that the unit had no definite plan, was admitted to be an experimental procedure, and was considered to be an additional step toward state medicine.

Society News.—Mr. Frank Van Dyk, executive secretary, Associated Hospitals, Newark, N. J., addressed a joint meeting of the Syracuse Academy of Medicine and the Onondaga County Medical Society, January 17, on group hospitalization.——Dr. William V. P. Garretson, New York, addressed the Medical Society of Westchester County, January 15, on "Allergy —A Neuro-Endocrine Interpretation."——Drs. Chevalier Jackson, Philadelphia, and Arthur Q. Penta, Schenectady, addressed the Schenectady County Medical Society, January 8, on "Indications for Bronchoscopy" and "Oral Spirochetes and Associated Anaerobes in Pyorrhea and Lung Abscess," respectively.

New York City

Hospital News.—Dr. Charles L. Scudder, Boston, delivered an address at a meeting of the clinical society of the New York Polyclinic Medical School and Hospital, Dec. 3, 1934, on "Trends in the Treatment of Fractures." Dr. Elliott C. Cutler, Boston, spoke, January 7, on "Treatment of Heart Disease by Total Thyroidectomy." Dr. Russell L. Cecil will give a lecture, February 6, on "Foreign Protein Therapy." Dr. Pol N. Coryllos lectured, January 12, on "Surgical Treatment of Tuberculosis."

Friday Afternoon Lectures.—The spring series of Friday afternoon lectures offered by the Medical Society of the County of Kings will be as follows:

February 15, Dr. Charles A. Weymuller, Pediatric Advances of the Last Few Years.
March 1, Dr. Morris Ant, Diet as a Prescription in Treating Diseases.
March 7, Dr. Anthony W. Martin Marino, Office Management of Diseases of the Anus and Rectum.
March 15, Dr. Frederick Schroeder, Prescription Writing.
March 22, Dr. Meyer A. Rabinowitz, Rôle of the Stomach in the Production of Diseases.
March 29, Dr. Alfred C. Beck, Fibromyoma of the Uterus Complicating Pregnancy, Labor and the Puerperium.
April 5, Dr. Charles S. Cochrane, Practical Methods of Diagnosing Surgical Kidneys by the General Practitioner.
April 12, Dr. William H. Field, Management of Common Injuries.
April 26, Dr. John Hamilton Crawford, Mechanism and Treatment of Cardiac Edema.
May 3, Dr. Francis W. Currin, Roentgen Diagnosis of Primary Tumor of the Lung.

Society News.—Drs. John L. Rice, health commissioner, and Sigismund S. Goldwater, hospital commissioner, addressed the Medical Society of the County of Kings, January 15, on "Relation of the Practicing Physician to the Health Department" and "The Department of Hospitals and the People of the City of New York," respectively.——A symposium on cancer was presented at the meeting of the International Spanish-Speaking Association of Physicians, Dentists and Pharmacists, January 18, by Drs. Eleanor S. Percival, Montreal, John F. Erdmann, New York, Charles F. Geschickter, Baltimore, and Frank H. Lahey, Boston. Dr. Jacob M. Gershberg, president for 1935, delivered an address on "The Late King Albert, President Poincaré, Professor Cajal and Madame Curie."——The committee on cardiac clinics of the New York Heart Association held a scientific meeting, January 22, at the New York Academy of Medicine, with Dr. Joseph Earle Moore, Baltimore, and Detlev W. Bronk, Ph.D., Philadelphia, as speakers, on "Treatment of Cardiovascular Syphilis" and "Nervous Regulation of the Heart," respectively.——Dr. Ralph Pemberton, Philadelphia, addressed the American Hungarian Medical Association, January 8, on "The Problem of Arthritis."——Dr. John J. Westermann Jr. presented a paper on "Surgical Aspects of Bleeding Gastroduodenal Ulcer" at a meeting of the New York Surgical Society, January 9.

NORTH CAROLINA

Bills Introduced.—S. 19 and H. 32, the budget revenue bills, among other things, propose to levy an annual occupational tax of $25 on practicing physicians, osteopaths, chiropractors and optometrists. Only one half of this tax, however, is to be levied on practitioners whose gross receipts from practice for the preceding year did not exceed $1,000. Failure of a practitioner to pay this tax may result in the revocation of his license to practice. Counties, cities or towns are to be forbidden to levy an additional occupational tax.

PENNSYLVANIA

Society News.—Dr. Charles F. Geschickter, Baltimore, addressed the Washington County Medical Society, January 9, on "Tumors and Hormones."——Dr. Joseph H. Barach, Pittsburgh, addressed the Blair County Medical Society, Altoona, Dec. 18, 1934, on "Present-Day Conceptions of Arterial Hypertension."

Bills Introduced.—H. 102, to amend the workmen's compensation act, proposes to make compensable anthracosis, asthma or bursitis acquired or resulting from employment in any process involving mining. H. 91, to amend the workmen's compensation act, proposes to make compensable certain occupational diseases, including poisoning by lead, mercury, phosphorus, arsenic, methanol, carbon bisulphide, naphtha, manganese dioxide, brass, zinc, benzol and nitro- and amido- derivatives of benzol; also compressed air illness, radium or x-ray burns, chrome ulceration, cancers and ulcers resulting from tar, pitch, bitumen, mineral oil or paraffin, and infection or inflammation of the skin resulting from contact with oils, cutting compounds, lubricants, dusts, liquids, fumes, gases or vapors; also anthrax, silicosis and chronic miners' asthma. H. 44, to amend the workmen's compensation act, proposes to extend from thirty days to sixty days the period during which an employer must furnish an injured workman medical and surgical services, medicines and supplies and to raise the amount of an employer's liability for such services from $100 to $150. The bill proposes also to increase from thirty days to sixty days the period during which an employer must furnish necessary hospital treatment and limits the cost of such treatment to the prevailing charges for like services to other individuals.

SOUTH DAKOTA

Bills Introduced.—H. 16, to amend the chiropractic practice act, proposes (1) to require an applicant for a license to have a high school education or its equivalent and to be a graduate of a chartered chiropractic school requiring actual attendance for four (instead of three as the law now provides) school years of not less than eight months each; (2) to define chiropractic as "the science of locating and removing any nerve interference and its effects," and as including "physical, hygienic and sanitary measures incident thereto," and (3) to remove the provision expressly prohibiting chiropractors from practicing obstetrics or treating contagious or infectious diseases. H. 25, to amend the law prohibiting the possession or sale or other distribution of peyote (pellote) and "agva Americana," commonly known as mescal button, proposes that nothing in the law shall prohibit a duly ordained priest or minister from possessing and using peyote for sacramental purposes if he first obtains a permit from the attorney general.

TEXAS

Bill Introduced.—H. 133 proposes to forbid the sale or other distribution, except by registered pharmacists or licensed physicians, of any article, drug or medicinal preparation intended for use as, or which may be used as, a contraceptive or prophylactic.

WASHINGTON

Bills Introduced.—S. 5 proposes to authorize the sexual sterilization of persons who may be potential parents of socially inadequate offspring. This bill seems to be one of the broadest and most radical sterilization bills ever considered by an American legislature. It defines a socially inadequate person as "one who by his or her own effort, regardless of etiology or prognosis, fails chronically, in comparison with normal persons, to maintain himself or herself as a useful member of the organized social life of the state," exempting therefrom persons whose social ineffectiveness is due to the normal exigencies of youth, old age, curable injuries and/or temporary physical or mental illnesses. A potential parent of socially inadequate offspring is defined as a person "who, regardless of his or her own physical, physiological or psychological personality, and of the nature of the germ plasm of such person's co-parent, is a potential parent at least one fourth of whose possible offspring, because of a certain inheritance from said parent of one or more inferior or degenerate physical, physiological or psychological qualities, would, on the average, according to the demonstrated laws of heredity, most probably function as socially inadequate persons; or at least one half of whose possible offspring would receive from said parent and would carry in the germ plasm, but would not necessarily show in the personality, the genes or genes-complex for one or more inferior or degenerate physical, physiological or psychological qualities, the appearance of which quality or qualities in the personality would cause the possessor thereof to function as a socially inadequate person, under the normal environment of the state." H. 5, to amend the chiropody practice act, proposes to permit a licensed chiropodist to examine, diagnose or treat medically, mechanically or surgically, or by electrical and manipulative means or by bandaging and strapping, the ailments of the human foot. Chiropodists, however, are not to be permitted to amputate the toes or to perform any operation requiring the use of anesthetics other than local.

WISCONSIN

Bill Introduced.—A. 10 proposes to make it the duty of a physician knowing that a person visited by him has a communicable disease or has died from a communicable disease to report the fact to the local health officer, commissioner or board immediately; to quarantine the infected place and the family, if necessary, if the disease has been designated by the state board to be quarantinable, and to obtain the necessary placards and to report such quarantine to the local health officer, commissioner or board.

WYOMING

Bill Introduced.—H. 28 proposes to authorize the state department of health to conduct, in cooperation with local authorities or medical societies, clinics for physically handicapped and crippled children. The cost of the operation of such clinics is to be financed in part by a tax of 2 per cent on the sale of cigarets and chewing gum.

Bill Passed.—H. 34 has passed the house, proposing to create a board of chiropodist examiners and to regulate the practice of chiropody. Licensed chiropodists are to be permitted to examine, diagnose or treat medically, mechanically, surgically or by electrical and manipulative means, or by bandaging and strapping, the ailments of the human foot, but are not to be permitted to amputate the foot or toe or remove any bone of the foot, or use any anesthetic other than local.

GENERAL

Society News.—Dr. Edwin G. Zabriskie, New York, was elected president of the Association for Research in Nervous and Mental Diseases at its annual meeting in New York, Dec. 27-28, 1934, and Dr. Angus M. Frantz, New York, secretary.——The Southern Neuropsychiatric Association will hold its annual meeting at Memphis, February 5-6, at the Hotel Peabody. Dr. Giles W. Day, Galveston, Texas, is president and Dr. Newdigate M. Owensby, Atlanta, secretary of the association.——A conference on slum clearance and rehousing was held in Washington, D. C., January 18-20, under the chairmanship of Mary Kingsbury Simkhovitch, New York, president of the National Public Housing Conference.——Dr. Raymond W. Bradshaw, physician to Oberlin College, Oberlin, Ohio, was reelected president of the American Student Health Association at the annual session in New York, Dec. 27-28, 1934. Dr. Wade MacMillan, Miami University, Oxford, Ohio, was elected vice president, and Dr. Harold S. Diehl, University of Minnesota Medical School, Minneapolis, secretary.——A National Nonpartisan Committee for Ratification of the Federal Child Labor Amendment has been formed, with Charles C. Burlingham, former president of the Association of the Bar of the City of New York, as chairman. Mr. Burlingham was president of the Welfare Council of New York in 1931.——The American Association for Thoracic Surgery will hold its annual session in New York, June 3-5.

The Woman's Auxiliary.—The January News Letter of the Woman's Auxiliary to the American Medical Association gives accounts of its activities. The Woman's Auxiliary to the Nebraska State Medical Association has organized a bureau which arranges for physicians to address lay organizations. In Florida, the Dade County auxiliary (Miami) established a fund to aid widows and children of physicians and sponsored the sale of Christmas seals. The Michigan state auxiliary has made a special effort to be informed on legislation affecting the medical profession and to be prepared to discuss it before other organizations. The Georgia auxiliary participated in welfare projects, such as preparation and dissemination of information on maternal welfare, cancer and tuberculosis; the state president, Mrs. John E. Penland, Waycross, is a member of the executive council of a new Child Welfare Council of Georgia. The Illinois auxiliary urges attention to medical legislation as part of its program for the year. Presiding officers of nearly 100 clubs attended a "public relations day" held by the auxiliary to the St. Louis Medical Society; Dr. Joseph F. Bredeck, city health commissioner, made an address on "Public Health Nursing Needs." The auxiliary at Walla Walla, Wash., continued sponsorship of a series of health broadcasts begun last year which proved a popular radio feature. In the District of Columbia, the activities were chiefly devoted to social service projects, assisting the Red Cross, the Associated Charities and Emergency Hospital. Members in Racine County, Wisconsin, have been visiting county and city institutions with a view to interesting members in them. In Oregon the woman's auxiliary of the state medical society is credited with a large share in the November defeat of the healing arts amendment to the state constitution which would have nullified the basic science law. In a campaign that

reached schools and women's organizations, the objective was dissemination of educational material concerning the issues involved.

Medical Bills in Congress.—*Changes in Status:* H. J. Res. 117, the "Emergency Relief Appropriation Act of 1935," introduced by Representative Buchanan, Texas, has passed the House, authorizing an appropriation of $4,000,000,000 for relief purposes. The United States Employees' Compensation Act is made applicable to employees, receiving compensation under the pending bill, who are disabled or who die from an injury sustained while in performance of duty, subject to certain conditions and limitations. H. R. 4442, the Treasury Department and Post Office Department Appropriation Bill for the fiscal year ending June 30, 1936, has been reported to the House, authorizing, among other things, an appropriation of $25,000 for special studies of and demonstration work in rural sanitation. *Bills Introduced:* S. 600, introduced by Senator Hastings, Delaware, proposes to authorize the dissemination of information relating to the prevention of conception, and articles, instruments, substances, drugs and medicines designed, adapted or intended for the prevention of conception, (1) by any physician legally licensed to practice medicine, or by his direction or prescription; (2) by any druggist in filling any prescription of a licensed physician; (3) by any medical college legally chartered, or (4) by any licensed hospital or clinic, except in any state in which such use is prohibited by the law thereof. S. 1226, introduced by Senator Hayden, Arizona, proposes to prohibit the sending of unsolicited merchandise through the mails. H. R. 3645, introduced by Representative Fenerty, Pennsylvania, proposes to authorize the President to accept radium, in an amount not exceeding $10,000,000 worth, from the Belgian government in payment of the debt owed by that country to the United States. The radium so accepted, it is proposed, will be distributed to hospitals, medical clinics and medical research organizations in the United States. H. R. 3802, introduced by Representative Hobbs, Alabama, proposes to repeal the Emergency Officers' Retirement Act of May 24, 1928. H. R. 4012, introduced (by request) by Representative McSwain, South Carolina, proposes to bring within the purview of the United States Employees' Compensation Act officers and enlisted men of the National Guard and the Organized Reserves who are physically injured in line of duty. H. R. 4030, introduced by Representative Beam, Illinois, proposes to amend "An Act to recognize the high public service rendered by Major Walter Reed and those associated with him in the discovery of the cause and means of transmission of yellow fever," by including therein the name of Gustaf E. Lambert. H. R. 4242, introduced by Representative Woodrum, Virginia, proposes to authorize the Reconstruction Finance Corporation to make loans to private colleges, universities and institutions of higher learning. H. R. 4315, introduced by Representative Reilly, Wisconsin, proposes to regulate the importation of milk and cream, and milk and cream products, into the United States. H. R. 4440, introduced by Representative Gambrill, Maryland, proposes to provide medical services after retirement on annuity to former employees of the United States disabled by injuries sustained in the performance of their duties. H. R. 4539, introduced by Representative Mead, New York, proposes to alleviate the hazards of old age, unemployment, illness and dependence, to establish a social insurance board in the Department of Labor, and to raise revenue.

Government Services

Annual Report of the Public Health Service

For the calendar year 1933 the general death rate in the United States was 10.5 per thousand of population, as estimated on statistics received from twenty-seven states, the annual report of the U. S. Public Health Service reveals. This is the lowest death rate on record for the United States. Preliminary reports for the first six months of 1934 show a somewhat higher rate in many places. During the year under report, the public health service conducted several studies in places where the economic depression has been most severe, and the results showed higher sickness rates in families most acutely affected by economic conditions. The birth rate again declined; there were 16.4 births per thousand of population in 1933, as compared with 17.4 in 1932. The infant death rate was 58.2 per thousand live births. Three diseases reached the lowest death rates ever recorded: tuberculosis 59 per hundred thousand, typhoid 3.5, and diphtheria 3.9. Although there were no widespread epidemics, three unusual local epidemics of major importance are discussed in the report: amebic dysentery in Chicago, affecting approximately 690 persons; epidemic encephalitis in St. Louis, which caused 1,100 cases with more than 200 deaths, and poliomyelitis in California, which started in May 1934 and extended beyond the end of the fiscal year. Nearly 400,000 cases of measles occurred in the calendar year 1933, and 656,000 cases were reported to the Public Health Service during the first half of 1934. Less than 7,000 cases of smallpox were reported for 1933, with less than forty deaths. Medical officers of the service by inspection of incoming vessels and airplanes at both foreign and domestic ports prevented the introduction of any quarantinable disease into the United States. Altogether 15,007 vessels and 3,668 airplanes and their passengers were inspected. The International Sanitary Convention for Aerial Navigation was signed on behalf of the United States, April 6, 1934. Vessels operating within the country are also inspected; the report notes that for the first time since inspection was inaugurated there was not a case of typhoid on boats plying the Great Lakes. Among the varied activities of the service during the year was its participation in the emergency civil works program. Three projects were carried out: assistance to fourteen states in malaria control, under which more than 6,000 miles of drainage ditches was dug; construction of more than 225,000 sanitary outdoor toilets in twenty-two states, and sealing of 7,000 openings in abandoned mines to remove acid wastes from water supplies in Alabama, Pennsylvania and West Virginia. In the research division, in addition to study of epidemics, the program included investigations of cancer, rheumatic heart disease, the use of atabrine in treatment of malaria, pellagra, and dietary factors in the production of cataracts. Examination of children of leprous parents over several years has demonstrated that it is possible to detect changes in the nerves and the capillary system well in advance of clinical manifestations of leprosy. Other investigations were made to determine the mode of entrance of the leprosy bacillus. During the year, 212 liters of vaccine for Rocky Mountain spotted fever was manufactured at the laboratory at Hamilton, Mont., for general use and 40 liters more for the Civilian Conservation Corps. A new laboratory building at Hamilton is almost completed. A total of 385,953 cases of syphilis, gonorrhea and chancroid was reported, a slight decrease from the preceding year. The clinic maintained by the service at Hot Springs National Park, Ark., cared for 6,682 patients, a greater number than ever before, owing largely to the great number of homeless transients who poured into the city during the year, the report said. The first United States Narcotic Farm, which will be under the control of the division of mental hygiene, will be completed and ready to receive patients in April. Funds have been made available through the public works program for beginning construction of the second farm, at San Antonio, Texas. The twenty-five marine hospitals operated by the service, together with relief stations in ports not served by these hospitals, cared for 305,155 patients, 42,611 having received treatment in hospitals and the remainder office treatment. In May 1933 a new administration building was opened in Washington, D. C. In closing his report the surgeon general made a number of recommendations for improving the public health. As part of the national defense against disease, the federal health service should cooperate with states on a more substantial basis than in the past, the surgeon general declared. He urged that quarantine regulations in the Panama Canal Zone be made uniform with those in force at other United States ports and that the Convention for Sanitary Control of Aerial Navigation, already signed by this country, be ratified as soon as practicable. Restoration of adequate appropriations for efficient operation of the marine hospitals and for control of venereal diseases was also pointed out as a necessity. Finally, the report asserts that the service is understaffed. Important matters in the regular work as well as the emergency activities of the government have made it necessary to detach experienced officers from their duties, leaving the latter to be performed by untrained personnel. The financial statement shows that of an appropriation of $10,630,587, there was expended a total of $8,721,451. The entire personnel at the end of the fiscal year included 10,727 persons. Of this number, however, 4,674 are collaborating epidemiologists, mainly officers of state and local health organizations, who receive only nominal compensation for furnishing vital statistics or similar services. The statement also includes all part time employees and those on a fee basis.

CORRECTION

We Have Tried Diets.—Under Society Proceedings in THE JOURNAL, January 19, page 251, the sentence in the discussion by Dr. Kaare K. Nygaard that reads "We have tried dyes" should read "We have tried diets."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 5, 1935.

Too Much Specialization in the Training of Nurses

At an inquiry into the training of nurses in Scotland, evidence was given by the department of health summarizing the history of nurses' training over the last fifty years. The status of nurses has improved greatly in the last twenty to thirty years, but still greater improvement is looked for, which will bring the profession nearer the standard of other professions. At present training is too sectionalized. This applies even to general hospitals, which fifty years ago were in fact "general," as they were the only hospitals. Now as the result of the development of special hospitals, general hospitals deal with a much narrower field of disease. Under existing circumstances a nurse wishing to obtain an all round training, embracing all sections of nursing, must spend a much longer time than in other professions. The question has arisen whether by cooperation between the various hospitals it would be possible for the nurse to pass rapidly from hospital to hospital and obtain an all round training in a reasonable time. If training of this kind could be taken in, say, five years, the nurse would be free thereafter to specialize in any branch to which she felt drawn. Evidence was given by witnesses from the Board of Control (the board which controls lunacy administration) that it would be an advantage if nurses in mental institutions were given general training. If they had this, the period of further training in a mental disease hospital could be substantially reduced.

The British Medical Association and the Registration of Osteopaths

The latest attempt of the osteopaths to obtain registration and the getting of a majority in favor of their bill in the house of lords were reported in a previous letter. The bill has been referred to a select committee. Four bills have been introduced by them since 1931. Alive to the danger of the situation, the British Medical Association appointed a special committee to draw up a memorandum on osteopathy for submission to the council. The memorandum describes the foundation of osteopathy in 1874 by Still of Kansas City, its development, theory, technic and practice, and makes the following criticisms: Osteopathy claims to have discovered a hitherto unrecognized and highly important cause of disease—"the osteopathic lesion"—which is defined as "a structural derangement, no matter how small or where found in the body, which interferes with the normal functioning of human mechanism." Such lesions are usually regarded as spinal and are said to be palpable and curable by manipulation. They are held to be responsible for most of the diseases of the human body. Thus the basis of modern medicine and surgery—physiology and pathology—as evolved by scientific research and taught in the medical schools is considered to be false, and bacteria as causal of disease and biochemical changes are of little significance. But what is the evidence for the osteopathic theory? Osteopathic literature is almost devoid of any pretense at scientific investigation. There is not a vestige of evidence to support the claim that the osteopathic spinal lesion is the principal cause of disease.

But there are indications that many osteopaths are retreating from these disturbing implications and are emphasizing the value of manipulative methods rather than its theoretical basis. A desire to incorporate all the medical curriculum, except drug therapy, is also evident. And there are signs that even this exception is being abandoned. The osteopath actually claims to cover the whole field of general medicine, thus admitting that medical science is necessary to him in his practice, if not in his theory, and wishes to be regarded as a healer equipped with a full medical training. There is therefore no reason why he should not follow the same procedure as the medical student and satisfy the General Medical Council as to his knowledge. He can thus qualify and thereafter practice any system he likes. The granting of registration for less than the full medical curriculum would be against the public interest. The position of the medical profession is that a necessary preliminary to osteopathic or any other form of treatment is diagnosis; that the minimum training for competence in diagnosis is the full medical curriculum; that any one who has passed this is free to practice osteopathy. The proposed registration of osteopaths would cause confusion in the public mind by creating registers of different standards. Modern medicine and osteopathy cannot both be right.

To these carefully reasoned criticisms the osteopaths have made no answer, except to allege motives. They say that the British Medical Association, from the narrow standpoint of professional interests, desires to prevent the public from enjoying the benefits of osteopathy. That the association has never asked that osteopaths should be prevented from practicing and has only presented arguments on public grounds against persons with an inferior standard of medical education being allowed to represent themselves as competent for the treatment of all diseases, like properly qualified physicians, is calmly overlooked.

An Industrial Museum Devoted to Safety

There is in London a unique museum, a permanent collection of methods, arrangements and devices for promoting the safety and health of the factory worker. All power driven machinery is a source of danger. In factory accidents last year 523 persons were killed and 104,119 injured. If accidents in building operations and at docks are added, the number of killed is brought up to 688 and of injured to 112,572. The sum paid in compensation is more than $10,000,000 a year, and when medical and legal expenses and loss due to derangement of work are added the total cost is estimated at between $40,000,000 and $45,000,000 a year.

A workman cannot be relied on always to ensure his own safety. A momentary lapse of attention may be disastrous. He may disregard and even deliberately set aside a protective appliance if he thinks that it hinders his work. Hence the greater need of mechanical protection.

In the health section of the museum are divisions devoted to the principal industrial disease, lighting, heat and ventilation, and welfare work. The museum is open to the general public, but it is mainly useful to employers and workers. It is useful also to designers of factories and to physicians. The claim is made that the appliances shown would prevent four out of every five factory accidents.

Poison Gas Warfare

At the Institute of Chemistry, Dr. Hervert Levinstein, one of the poison gas experts during the war, in a lecture said that the widespread notion that science had made war so dangerous that it was less likely to happen was based on a fallacy. The application of chemical science to war had not made war more dangerous either to soldiers or to civilians but it had given fresh possibilities for effecting a strategic surprise that might decide a campaign. It was this and not greater brutality that was the distinguishing feature of chemical warfare. Far more destruction of property, greater mortality and suffering were caused by dropping high explosive or incendiary bombs from aircraft than by using gas-filled shells. But gas might be more effective in causing a panic among uninstructed and unprotected civilians. The wars that devastated Europe in the seventeenth and eighteen centuries were proportionately more wasteful of life than the great war, in which casualties were caused chiefly by the lack of invention—by reliance on mere

numbers of men and projectiles. The casualties caused by gas to the American troops, who arrived at the front when the use of gas had reached its maximum, numbered 75,000, of which only 1.5 per cent were fatal. But of their total casualties (275,000), 30 per cent proved fatal. This was an instance of what had been proved to be generally true—that toxic substances, such as mustard gas and phosgene, caused far less mortality than high explosive shells but were more effective in military results. Thus science had not made war more dangerous to life.

Nutrition Clinics for London School Children

The Labor majority of the London County Council has introduced a number of new arrangements for the medical and dental treatment of school children. These include additional treatment centers, dental inspection and nutriment for children under treatment, the establishment of nutrition clinics and new methods for the early treatment of ear, nose and throat diseases. Five nutrition centers are to be established in London. Cases will be referred to these by school physicians, teachers and the care committees. Each child will be given a thorough examination to ascertain whether its physical condition may be due to dietetic deficiency. If so, advice will be given to the parents and, when possible, nutritives and tonics, such as cod liver oil, malt and iron, will be provided. It is proposed to arrange for the extension of dental inspection and treatment facilities, so that all children in the schools shall be inspected by the dental surgeons once a year and the consequent treatment given.

PARIS

(From Our Regular Correspondent)

Dec. 20, 1934.

The Lack of Control of Pharmaceutic Products

The necessity of a stricter supervision of the innumerable pharmaceutic products is being felt both in France and in Belgium. In France the practitioner has his choice of more than 5,000 preparations. The Council on Pharmacy and Chemistry of the American Medical Association was held up as a model which other countries could well afford to adopt, in an article by two Belgian professors, Dautrebande and Zunz, in the Dec. 1, 1934, issue of the *Paris médical*. At present any one without any special training or diploma can manufacture and sell to the public any remedy he pleases. Nothing prevents the sale of these preparations, no matter how little basis there exists for the extravagant claims made to cure every known ailment. Sometimes a specialty for the publicity of which large sums are spent is composed of harmless ingredients without any therapeutic value. In other cases the analysis shows that the preparation does not correspond at all to the advertisement and the patients, instead of being benefited, grow worse with subsequent unnecessary prolongation of the disease. The physician himself is led astray by the glowing descriptions and the generous number of samples sent by the manufacturer. Uncontrolled publicity has done far more harm than one would imagine; hence many European countries have appointed committees to study the question, but generally the recommendations of such bodies have not had much real effect.

The authors of this article quote the organizations of control in Belgium, the Netherlands and Switzerland. In Belgium a sample is subjected to analysis, which has the sole object of verifying that the specialty actually contains the ingredients claimed for it by the manufacturer. In reality, as the authors state, the chief object of the analysis is to assure the druggist who is to sell the product. No responsibility is assumed as to the therapeutic value of the specialty, because the control organizations have no funds at their disposal to verify the biologic action of the preparations and also have no authority over the publicity claims of the manufacturer. The control of the specialties is better organized in the Netherlands, but even there the funds at the disposal of the council on pharmacy are inadequate, only about $5,000 a year, and hence the analyses are done in the various university laboratories. The Institute, as the control body is termed, issues, at intervals of six months, monographs containing critical analysis of our knowledge of new remedies, which are sent to all physicians and pharmacists. The control of pharmaceutic specialties in Switzerland was not organized until 1932, when a central laboratory for analyses was established at Berne. The chief object is to verify that the preparation contains the ingredients claimed for it by the manufacturer. More attention is paid to the drugs included in the Swiss pharmacopeia than to the analyses or control of nonofficial remedies.

The remainder of the article is devoted to a detailed description of the Council on Pharmacy and Chemistry of the American Medical Association, and a plea is made for the use of this body as a model for all countries that wish to control the rapid increase in pharmaceutic specialties of good, bad or indifferent composition. Some such control is certainly needed in the near future in France.

Decline in French Birth Rate

France has been termed a "country of bachelors and one child families." Paul Ballard in a recent article stated that the fall in the birth rate is assuming the proportions of a national peril. During the last sixty years the population of Germany has increased 24 million and that of Great Britain 19 million, while that of France increased only 2 million. Italy, Great Britain and Japan combined are as large in area as France, yet these three nations combined have a larger number of children than France. In 1830 there was an average of four births to a family. In 1890 it had decreased to three, and today it is two. During the first nine months of 1933 there were 30,000 less births than in the corresponding period of 1932.

Attention has been called to the decline in birth rate of the white race all over the world.

History teaches that whenever a country has attained a high degree of civilization, the birth rate begins to decline, and then follows invasion or colonization by more fertile races on its soil. The present condition of France is not unlike that of Rome, which was obliged in its later period to depend on paid foreigners to defend it, to see wheat from other countries supplant its own agriculture, to find that the rural population flocked to the cities and the citizen neglected his responsibility and avoided paternity. Soon after these events, Rome was invaded by barbarians and its ruin soon followed. Even in the country districts of France there is a tendency to have smaller families to avoid added expense and division of property, acquired through years of thrift such as only the French peasant knows.

Only by direct aid in the way of reduced taxes, rewards for large families, heavy taxation of bachelors, reduction in the number of women engaged in commercial pursuits, and severe laws against abortion, will the birth rate rise. Such encouragement has been given in the form of legislation and other measures in Italy and Germany during recent years. In Italy, more births were reported during the first six months of 1934 than in the previous two years.

Scarcity of Physicians in Rural Districts

The department of public health has issued a circular again calling attention to the excessive number of physicians, dentists and pharmacists in cities and the small number who are willing to settle in rural communities. An office has been opened in the department of public health to gather facts and give information regarding the inducements offered by small communities for the physician, dentist and pharmacist. These inducements

consist in salaries or guaranties and all heads of the eighty-six departments into which France is divided have been notified to cooperate in furnishing medical care to country districts. In the *Concours médical,* Dec. 9, 1934, Noir states that the great difficulty in finding recent graduates who would be willing to practice in these rural communities is that the latter are so small that one could not earn a living. Quite often the inducements offered prove to be illusory, owing to the fact that some enthusiastic official overestimates the possibilities of developing a paying practice, or for political purposes some official wishes to set up an opposition to a practitioner in an adjacent community. This writer warns young physicians and dentists to consider well the verbal promises of a fixed revenue, by the local officials, and to insist on a written contract.

It is suggested that, before announcing an opening, the Bureau of Information should be certain that the offer is genuine, and if a district is too poor to be able to assure a sufficient income it would be wise for the central government in the cities or county seats under whose jurisdiction the district is placed to grant a subsidy. This already exists in the mountainous country of southeastern France. The great danger, of course, lies in the fact that the medical man becomes one of the already large army of public officials.

French Tuberculosis Congress of 1935

The 1935 session of the French National Tuberculosis Congress will take place in April at Marseilles. The subjects to be discussed are the rôle of the tuberculous ultravirus in human and experimental pathology, the indications and results of thoracoplasty in the treatment of tuberculosis, the fight against tuberculosis in North Africa, and the prophylaxis of tuberculosis in the navy.

BERLIN

(From Our Regular Correspondent)

Nov. 26, 1934.

Castration and Problems of Heredity

Dr. Schlegel, director of the state hospital attached to the examination prison at Moabit, Berlin, recently published the first report on castrations performed. The largest number of castrations in compliance with the latest law in Germany are performed in this institution. The application of the law of Nov. 24, 1933, to habitual criminals is, according to Dr. Schlegel, in many cases entirely vague. Besides punishment by imprisonment, the court may also interpret castration not as a punishment but as a "regulatory means of protection and improvment" for habitual criminals and as a protective measure for the people who may fall victims to sexual criminals. In this state hospital there have been 111 castrations performed since the law became effective. Twenty more prisoners in being prepared for castration were subjected to the strictest examinations. A photographic picture definitely retains the identity of every one. The blood, the blood pressure and the sedimentation rate were analyzed. The voice and its tonal color were fixed on phonographic records. A thorough opinion was formed about the mind and intelligence of every one. The operation for amputation of both testicles was performed under local anesthesia within about eight minutes. Thus far no deaths have occurred. The patients were between the ages of 20 and 60. A central national card index of patients presenting hereditary diseases will be established, as stated by a communication of the medical department of the national health bureau, and in this way a systematic survey of the hereditarily diseased patients will be produced. This will serve as a basis of evaluation for the new racial and eugenic law. It must begin with the indexing of patients having mental diseases in order to make use of the large material accumulated in the archives of institutions for mental patients. The national health bureau has prepared an index form containing eighty questions pertaining to personal data, precise psychiatric diagnostic data and hereditary disease data. Preliminary work for carrying out the law has been done at the hygienic institute of the University of Münster (Westphalia). Dr. Mehring has tested the fecundity of the parents of mentally deficient individuals and of pupils not able to meet the requirements of a grade school. The results showed that in Münster the fecundity of the hereditarily inferior families is one and a half times greater than the fecundity of hereditarily healthy families.

The question is raised as to whether biology and the science of heredity, especially, are in a position to establish a support for the legislator. Some lectures given in Bremen under the title "Prevention of Useless Lives" are of interest. From the first of the lectures given by the late Professor Baur, director of the Kaiser Wilhelm Institute for Research on Breeding, it would appear that the originator of the law did not go far enough. He refers to natural selection. The theory in bare outline is that man as a species may stay healthy only if the natural selection, which is eliminated in a cultural status, is reestablished by conscious efforts directed toward the prevention of hereditarily inferior types. There is, however, no natural selection but only natural elimination, and the sociologist W. E. Mühlmann of Berlin has so stated in the second lecture, entitled "The Selection Process in Human Society." In the third lecture, Dr. F. K. Walter, professor of psychiatry and director of the Institute for Mentally Diseased Patients at Bremen, objected to the manner in which the legislator applied the mendelian law of heredity to the human race, whereby he entirely overlooked the difficulties of its application. Walter emphasizes that the mendelian law is fulfilled, primarily, in case of large numbers, so that a dominant character, for example, a good or a bad quality of the parents, will reappear in 50 per cent of the children. One must therefore figure on 1,000 children in order to expect the dominant character in 500 children. The smaller the number, the more uncertain the expected percentage becomes. In Germany the average number of progeny being three, the prediction becomes naturally less safe than in animal and plant research, in which the number of progeny is high. Secondly, the human progenitors possess, by reason of cross-breeding, not merely hundreds but thousands of individual hereditary factors, and this point introduces a new factor of unsafety into the prediction. Walter gave some striking examples. He discussed a family with acute hereditary mental disease, which was under his observation for a long time. Members of the family had a remarkable proclivity for mathematics, and at least three mathematicians of world fame and a line of scientifically recognized naturalists were born into the family. For these reasons Walter is against unconditional sterilization in cases of the following hereditary diseases, included in the German sterilization law: congenital, hereditary deaf-mutism, certain forms of hereditary weakness of mind, certain forms of epilepsy and schizophrenia. He cautions, furthermore, against an overestimation of sterilization prospects, even in cases in which sterilization is in order, because the inheritance mechanism in the majority of hereditary diseases is unknown. The view of negative eugenics was stressed in the fourth lecture by E. H. Rosenberg-Münster, jurist. If, for instance, all epileptic patients of a generation could be sterilized, this disease would not disappear; the old sources would break out again (recessive hereditary process), and new sources would develop (mutations). The retrogression would be slight.

The First Professorship for Public Health

The first professorship in public health has been established in the University of Munich. Professor Dr. Schultze, the new state commissioner for public health in Bavaria, has been appointed lecturer. In his inaugural lecture he pointed out first

the negative side of his professorship; namely, combating the errors in medicine due to specialization. The problems of the new discipline in science are, as he stated, racial supervision, dwelling and colonization problems, social insurance, and determination of the useful in folk remedies, the single great objective being that public health is political power.

ROME

(From Our Regular Correspondent)

Dec. 15, 1934.

Congress of Internal Medicine

The Società Italiana di Medicina Interna held recently its fortieth national congress, in Rome. The first official topic concerned vaccines and nonspecific treatment in infectious diseases. Dr. Introzzi spoke on the therapeutic value of vaccines in undulant fever. Specific vaccine given by vein is the most efficacious treatment of brucella infection in man, as has been proved by the results of its use since 1926 by many physicians. The best effects are obtained when the vaccine causes a general, intense reaction. Vaccination should be regarded as a desensitization of the organism in a condition of allergy rather than as a stimulation of the natural powers of defense of the organism. Then the useful reactions would be due to a given dose of the vaccine, which would be determined in each case by the administration of injections of tentative doses. Intravenous injections are not dangerous and have no limitations related to the stage and clinical form of the disease, if given with the proper technic. In the clinic at Pavia the vaccines are prepared by Pfeiffer and Kolle's method. The emulsions are prepared in phenolated physiologic solution with the cultures of bacteria killed by heat in a water bath.

The second official topic was on pleural diseases in the army. Dr. R. D'Alessandro of the Scuola di Sanità Militare said that the statistics from 1921 to 1930 prove that pleurisy is one of the most frequent and grave diseases among soldiers in active service and that it is related to the climate and the weather of the territories occupied by the soldiers as well as to the military service to which the soldiers belong. The highest rate of mortality is observed during May, June and July; that is, shortly after the recruits enter service. In tuberculous pleurisy, which is the most frequent form, the inflammation of the pleura may follow the formation of an early tuberculous infiltration, it may be caused as an allergic reaction to the reactivation of tuberculous foci (in the secondary stage of tuberculosis) or it may appear at the final period of tuberculosis. In cases of traumatic pleurisy, one should estimate the preexisting bacterial and the recent traumatic factors and also determine the nature of the trauma and when it occurred. Age is important among recruits. Most of them are about 21, an age at which the reactivation of latent tuberculosis is frequent. He observed in a group of 600 tuberculous patients attending the Centro di accertamento diagnostico dell'Ospedale Militare of Florence 300 who had had a preexisting pleurisy. The incidence of tuberculosis was higher in patients of this subgroup than in those who had not previously suffered from pleurisy, and form of tuberculosis was more serious in patients of the first than in those in the second subgroup; that is, 35 per hundred to 22 per hundred. It is advisable to make periodic examinations for the early diagnosis of tuberculosis among soldiers who enter the army after having had pleurisy.

The last official topic was meteoropathies. Dr. Nicola Pende, a senator and physician in Genoa, discussed the pathogenesis and treatment of meteoropathies, which he defined generally as local autonomic and protopathic morbid reactions, causally and chronologically related to sudden meteorological changes. The speaker classified the condition, from a clinical point of view, into three groups: (1) syndromes caused by special winds, (2) reactions caused by the passage of cyclones and (3) accidents appearing coexistently with the passage of large solar spots. The speaker pointed out two important facts: The weather, not by itself but in association with all factors of the meteorological environment are the meteoropathic agents, and the patients are in a condition of neuro-endocrine unbalance with excitability of the sympathetic nervous system.

Dr. Bufano of Genoa spoke on the experimental physiopathology of meteoropathic reactions. The speaker called attention to the importance of the atmospheric conditions of electricity, temperature and humidity in the etiopathogenesis of meteoropathies, morbid conditions improperly nominated "cyclonosis." Meteoropathies are essentially neurosis of the sympathetic nervous system, the central and peripheral reactions of which take place under the action of the atmospheric elements through the skin and the mucous and alveolar surfaces of the respiratory tract.

The Congress of the Italian Surgical Society

The forty-first congress of the Società Italiana di Chirurgia was recently held in the headquarters of the surgical clinic of the University of Rome, under the chairmanship of Dr. Roberto Alessandri. The first official topic was surgery of the colon, presented by Dr. Dominici of the University of Perugia. The speaker discussed the clinical importance of congenital and acquired malformations of the colon, with special reference to megacolon. True megacolon, the speaker believes, originates in an unbalance of the sympathetic-parasympathetic functions, the cause of which is unknown. The theory of a sympathetic hypertonia as the cause seems to be confirmed by the satisfactory results of lumbar sympathectomy in the treatment of the condition. An abnormally long colon does not imply surgical intervention unless it causes obstruction or painful crises. Chronic intestinal stasis presents many unsolved problems. The tendency is to consider it as a syndrome that may appear in several diseases rather than as a disease by itself. In discussing trauma of the colon, he said that wounds only of the colon have a benign evolution, while a high mortality rate follows the wounds of the colon that coexist with wounds in some other viscera. In cases of associated colonic and visceral wounds, immediate surgical intervention is indicated. One may say, schematically, that surgical intervention is indicated only as an exception in acute peritonitis without complications, while its indications are more frequent in chronic peritonitis. A simple laparotomy is indicated in ulcerous tuberculous colitis, and there are other operations indicated in the different forms of tuberculosis of the colon.

Alessandri spoke also on diverticula of the colon, obstruction, volvulus, intussusception and polyposis. Several other articles on the same topic were read and a general discussion followed.

The second official topic, bronchiectasis, was presented in connection with the Società di Medicina Interna. Dr. Omodei Zorini of Rome covered the medical aspect of the topic. Bronchiectasis may be congenital or acquired. The acquired form originates in infections of the respiratory tract. At the onset only the mucosa is involved, then the structure of the bronchial walls; then a mechanism of pulsation and traction, due to the stagnation of the secretions, is established, and lastly pleural and peribronchial sclerosis develops. In bronchiectasis with poor bronchial drainage, it is advisable to resort to bronchoscopy with aspiration of secretions, pneumothorax or intratracheal instillations of antiseptic drugs.

Dr. Vallebona of Genoa spoke on the importance of bronchography in bronchiectasis either by itself or with the refinement of stratigraphy, a method by which superposition of shadows is avoided and only a given stratum of the object is reproduced. The roentgen picture of large congenital pulmonary cysts may closely resemble that of pneumothorax. The roentgen examina-

tion is of paramount importance, because with it one can determine whether or not the given condition is in an evolutionary or a stationary stage.

Dr. Alessandri was the official speaker on the subject of surgery in bronchiectasis. The preoperative preparation of the patient, especially by means of postural drainage, is important. Phrenico-exeresis, thoracoplasty and plugging are the methods indicated to induce collapsotherapy, the results of which may be good although not permanent. In suppurative complications, pneumotomy and frequently partial pneumectomy is the necessary operation. The speaker is still undecided whether lobectomy should be performed in one operation or in two or more. His statistics show four deaths in forty-five operations by the first method and six deaths in fifty-seven operations by the second. His own experience includes seventy-two cases of bronchiectasis with twenty-seven operations.

Dr. Lasagna of Parma spoke on bronchoscopic diagnosis in bronchiectasis. In peroral endoscopy, to prevent incidents during the introduction of the instrument, it is necessary to have a thorough knowledge of the anatomic details and of the frequent abnormal disposition of the main and secondary bronchial branches. It is necessary to have in mind the functions of the ciliated epithelium, the mucus, the musculature and the current of air during either inspiration or expiration. The speaker described the various types of bronchoscopes now in use. Block anesthesia of the laryngeal nerve suffices in most cases; in a few cases, general anesthesia is necessary. There are some contradictions related to the anesthesia, to the pulmonary diseases present, and to general diseases. In the general discussion that followed, Dr. Micheli of Turin said that bronchiectasis is most frequently of congenital origin and that, generally speaking, the medical treatment gives satisfactory results.

BUDAPEST

(From Our Regular Correspondent)

Dec. 14, 1934.

Method of Preparing Cancer Statistics Should Be Revised

According to Dr. K. Wolff, the method of preparing cancer statistics should be revised. The only reliable statistics are those founded on diagnoses established in vivo by postmortem protocols, on histologic sections, and on the data afforded by compulsory death certificates. Unsupported clinical diagnoses of cancer, according to calculations, are erroneous in from 15 to 30 per cent of cases, and exact statistics cannot be expected without histologic controls. The verdicts of coroners, some of whom are not medically qualified, are unreliable. Thus, statistics that appear to prove the increase of cancer mortality may indicate only the development of the science of diagnosis; whereas cancer mortality rises in such statistics, the number of cases labeled senile marasmus, cause unknown, and other indefinite diagnoses decreases. Well trained physicians know that nobody dies solely from senile debility; if the patient had no other disease he would be certain to have had myocardial degeneration or a bronchopneumonia. Postmortem statistics are also unreliable, because they do not reflect the conditions of the whole population but of the hospital class. This objection holds true still more with regard to statistics based on histologic material alone. The fewer the cases utilized in the compilation of cancer statistics, the less reliable are the results. In one hospital the leading surgeon may have a predilection for cancer cases; hence the cancer turnover is high. Another hospital hardly admits cancer patients, because its surgeons work on other lines; the number of cancer cases here will be low. Such sources of error can be eliminated by the collation of the material of many hospitals, when those which have large children's departments will serve to balance others dealing exclusively with cancer cases. Thus a fairly accurate picture of the conditions of population could be obtained, but only of the hospital class.

The statistics heretofore published do not prove, in Dr. Wolff's opinion, the assumption that the rate of mortality from cancer shows a rising tendency. A relative rise is the obvious corollary of the fact that the number of deaths from other curable and preventable diseases is diminished. But this means no more than that the human race at present is unable to defend itself against cancer because neither the cause, the therapy nor the prophylaxis of cancer is known. The average duration of life is increasing all over the world. Cancer is the disease of elderly persons. If the average duration of man's life is increasing, there are more elderly persons; that is to say, more people reach the age at which cancer is apt to occur. In Dr. Wolff's view the apparent increase in the incidence of cancer has been too much emphasized. The mortality rate of every disease displays some oscillations if a comparative scrutiny is made of the statistical material available over several years.

The statistics collected at Budapest show no progressive increase of cancer, its occurrence being fairly constant. Between 1919 and 1923 among the necropsies in the Budapest University clinics on patients over 20 years of age, the cancer rate amounted to 12.42 per cent, while between 1924 and 1928 it amounted to 12.52 per cent. Since in quite recent years a larger proportion of different sections of the population seek relief in hospitals and are subjected to routine postmortem examinations, it can be believed that the data provided by postmortem statistics today are nearer to reality, and more nearly representative of the truth, than the other statistics.

The Teeth of School Children

The school medical inspectors of the municipal schools, in their recent report, speak strongly as to the amount of dental cases, and as to the absolute indifference shown by the parents when their attention is drawn to it. Most of them think it is hereditary—they themselves had bad teeth, and their children also must suffer. Of 1,500 girls examined, only 432 had satisfactory teeth; and the same proportion was found also in boys. The lack of interest taken as to cleanliness and preservation of teeth is the more regrettable when it is stated that half of the children leaving school and suffering from dental caries were yet in such a condition that their teeth could be saved at but little expense. Conservative dentistry, however, is unknown among the children.

Marriages

FRANCIS WILLIAM HOBART, Lake City, Iowa, to Miss Blanche States of Coon Rapids, in Rockwell City, Dec. 6, 1934.

WILLIAM ORRIN MCDOWELL, Grundy Center, Iowa, to Miss Faye Hanway of Des Moines, Nov. 23, 1934.

IHIMER MAXWELL CASEBEER, Clinton, Ind., to Miss Mary Eaton Short at Rockville, Oct. 20, 1934.

ROBERT C. CRUMPTON, Webster City, Iowa, to Miss Esther Isvik of Jewell, Nov. 29, 1934.

JOHN HEINZ VENABLE to Miss Louise Felker Ware, both of Atlanta, Ga., Dec. 18, 1934.

ESTHER MARGARET KIRK to Mr. Roy A. Foster, both of Oklahoma City, January 7.

HARLEY BENN LEHNERT to Miss Gladys Knierim, both of Toledo, Ohio, Dec. 1, 1934.

HENRY LEWIS COOPER, Denver, to Miss Helen Lucile Ratner of Chicago, Nov. 18, 1934.

CHARLES A. TERHUNE, Rupert, Idaho, to Miss Ruth Story of Burley, Nov. 30, 1934.

THEODORE L. BORDSEN to Miss Vi L. Cleverley, both of Seattle, Dec. 8, 1934.

NORRIS E. HAROLD to Miss Cora Schoen, both of Indianapolis, Dec. 23, 1934.

Deaths

Walter Lincoln Burrage ✠ Brookline, Mass.; Harvard University Medical School, Boston, 1888; since 1909 secretary of the Massachusetts Medical Society; clinical instructor in gynecology at his alma mater, 1893-1895; house physician to the Boston City Hospital, 1886-1888, and the Woman's Hospital, New York, 1888-1890; visiting gynecologist to the Carney and St. Elizabeth's hospitals, Boston, 1890-1903; surgeon to outpatients, Free Hospital for Women, 1890-1901; secretary of the Boston Medical Library, 1911-1926; in 1912 collaborated with Dr. Howard A. Kelly on two volumes of "American Medical Biography"; rewrote Dr. Kelly's book on "Appendicitis"; in 1910 assisted him with a book called "Medical Gynecology," in 1920 "American Medical Biographies" and in 1928 "Dictionary of American Medical Biography"; author in 1910 of "Gynecological Diagnosis," in 1923 "A History of the Massachusetts Medical Society, 1781-1922," and in 1931 "Catalogue of Honorary, Past and Present Fellows, Massachusetts Medical Society, 1781-1931"; in 1930 contributed in the fifth volume of the Commonwealth History of Massachusetts a chapter on "Medicine in Massachusetts"; aged 74; died, January 26.

E. Otis Smith ✠ Cincinnati; Medical College of Ohio, Cincinnati, 1896; Member of the House of Delegates, 1910, 1911, 1913, 1918 and 1921, American Medical Association, and secretary of the Section on Genito-Urinary Diseases, 1918-1919, and Secretary of the Section on Urology, 1919-1920; past president of the Ohio State Medical Association; member of the American Urological Association; fellow of the American College of Surgeons; professor of urology, University of Cincinnati College of Medicine, 1908-1933; director of the urological service, Cincinnati General Hospital; aged 63; died, Dec. 26, 1934, in the Good Samaritan Hospital, of pulmonary edema.

Robert Uriel Drinkard ✠ Wheeling, W. Va.; Johns Hopkins University School of Medicine, Baltimore, 1908; Member of the House of Delegates of the American Medical Association in 1931; councilor of the first district of the West Virginia State Medical Association; past president of the Ohio County Medical Society; fellow of the American College of Surgeons; served during the World War; on the staffs of the Ohio Valley General Hospital and the Wheeling Hospital; aged 55; died suddenly, January 3, in Bunnell, Fla., of myocarditis.

Frank Harrison McGregor ✠ Mangum, Okla.; University of Louisville (Ky.) School of Medicine, 1913; formerly secretary of the Greer County Medical Society; councilor of the second district of the Oklahoma State Medical Association; at one time member of the state board of medical examiners; served during the World War; part owner of the Border-McGregor Hospital and Clinic; aged 47; died, January 5, near Bowie, Texas, when he was struck by a truck.

Charles Benjamin Younger ✠ Chicago; Northwestern University Medical School, Chicago, 1902; assistant professor of otolaryngology at his alma mater; fellow of the American College of Surgeons; past president of the Chicago Laryngological Society; aged 59; on the staff of the Wesley Memorial Hospital, where he died, January 11, of coronary thrombosis.

Edwin William Stork ✠ Somerville, Texas; University of Texas School of Medicine, Galveston, 1920; served during the World War; for many years member and president of the board of education, and health officer of Somerville; on the staff of the Sarah B. Milroy Hospital, Brenham; aged 42; died, Nov. 19, 1934, as the result of septicemia.

William Ainslie Goodall, New York; Victoria University Medical Department, Coburg, Ont., Canada, 1884; member of the Medical Society of the State of New York; for many years on the staff of the Morrisania City Hospital; aged 72; died, January 6, in the Wickersham Hospital, of influenza and gastric hemorrhage.

Marshall Blair Morgan, Huntingdon, Pa.; Jefferson Medical College of Philadelphia, 1915; member of the Medical Society of the State of Pennsylvania; past president of the Huntingdon County Medical Society; on the staff of the J. C. Blair Memorial Hospital; aged 41; died, Nov. 24, 1934, of infectious hepatitis.

Kenneth Simms Caldwell ✠ A. Surg., Lieut., U. S. Navy, retired, St. Paul; University of Minnesota Medical School, Minneapolis, 1918; entered the navy in 1919 and was retired in 1921 for incapacity resulting from an incident of service; aged 42; died, Oct. 2, 1934, of a gunshot wound in the left side of the chest.

John Fox Connors ✠ New York; University of the City of New York Medical Department, 1895; served during the World War; member of the American Surgical Association; fellow of the American College of Surgeons; for many years on the staff of the Harlem Hospital; aged 61; died, January 5, of embolism.

Lee Hugo Koehler, Alliance, Ohio; Harvard University Medical School, Boston, 1932; third assistant resident medical officer to the Sanatorium Division of the Boston City Hospital; aged 28; died, Dec. 26, 1934, in a garage at Berlin Center, of carbon monoxide poisoning, while making repairs on his automobile.

Charles E. Fairman, Lyndonville, N. Y.; St. Louis Medical College, 1877; member of the Medical Society of the State of New York; for many years health officer of Yates, Orleans County; on the staff of the Medina (N. Y.) Memorial Hospital; aged 77; died, Dec. 27, 1934, of angina pectoris and arteriosclerosis.

Ray McKelvey Alexander, Bolivar, Pa.; Western Pennsylvania Medical College, 1905; member of the Medical Society of the State of Pennsylvania; served during the World War; for many years member of the school board; aged 55; died, Dec. 25, 1934, in St. Francis Hospital, Pittsburgh, of heart disease.

Joseph Adam Weitz ✠ Montpelier, Ohio; University of Michigan Medical School, Ann Arbor, 1886; past president and secretary of the Williams County Medical Society; formerly county health officer and member of the school board; aged 85; died, January 11, of coronary thrombosis.

John C. Knight, Jonesboro, Ind.; Kentucky School of Medicine, Louisville, 1881; member of the Indiana State Medical Association; for many years member of the school board; formerly member of the state legislature; aged 78; died, Dec. 27, 1934, of acute nephritis and myocarditis.

Sheldon Eli Cook, Lincoln, Neb.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1884; member of the Nebraska State Medical Association; past president of the Lancaster County Medical Society; aged 77; died, Dec. 31, 1934, of carcinoma of the pancreas.

Lawrence Wells Whitmer, Chicago; College of Physicians and Surgeons of Chicago, 1892; aged 75; formerly on the staff of the Illinois Masonic Hospital, where he died, January 2, of chronic myocarditis and hypostatic pneumonia following an operation for gallstones.

William E. Buxton, West Salem, Ill.; Central College of Physicians and Surgeons, Indianapolis, 1881; member of the Illinois State Medical Society; president and formerly secretary of the Edwards County Medical Society; aged 76; died, January 2, of pneumonia.

Melvin A. Wardwell ✠ Penobscot, Maine; Bellevue Hospital Medical College, New York, 1898; past president of the Hancock County Medical Society; on the staff of the Community Hospital, Castine; aged 61; died, Dec. 29, 1934, of angina pectoris.

Thornton Easley Moore ✠ Trenton, Mo.; University of Missouri School of Medicine, Columbia, 1903; past president of the Grundy County Medical Society; on the staff of the Wright Hospital; aged 56; died recently, of angina pectoris.

Warren Laws Snider, Hot Springs National Park, Ark.; Medico-Chirurgical College of Philadelphia, 1902; member of the Arkansas Medical Society; served during the World War; aged 56; died suddenly, in December 1934, of heart disease.

Arthur William Loeber, Milwaukee; Marquette University School of Medicine, Milwaukee, 1931; aged 30; was found dead, Dec. 29, 1934, of asphyxiation when a gas stove flame was extinguished by a kettle of water boiling over.

Byron Monroe Sell ✠ Altoona, Pa.; Jefferson Medical College of Philadelphia, 1924; also a minister; connected with the Altoona Clinic; aged 37; on the staff of the Mercy Hospital, where he died, Dec. 9, 1934, of heart disease.

Augustus E. Venn, Chicago; University of Pennsylvania School of Medicine, Philadelphia, 1893; aged 69; died, January 7, in the Alexian Brothers' Hospital, of chronic myocarditis following operation for intestinal obstruction.

Cyrus John Strong, Miami, Fla.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1891; member of the Florida Medical Association; aged 72; died, Dec. 19, 1934, of intestinal obstruction.

Edgar Carroll, Dayton, N. J.; Jefferson Medical College of Philadelphia, 1880; member of the Medical Society of New Jersey; formerly on the staff of St. Peter's General Hospital, New Brunswick; aged 81; died, Nov. 18, 1934.

Frank E. Smith, Portland, Ore.; Willamette University Medical Department, Salem, 1898; past president of the Board of Medical Examiners of the State of Oregon; aged 61; was killed, Dec. 30, 1934, in an automobile accident.

Jonas Rhodes Longley ✠ Fond du Lac, Wis.; Rush Medical College, Chicago, 1906; served during the World War; on the staff of St. Agnes Hospital; aged 55; died, January 2, in New Orleans, of acute gastritis and nephritis.

Lina D. Schwatt, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1912; for many years resident physician to the Philadelphia Hospital for Mental Diseases; aged 68; died, Dec. 22, 1934, of pneumonia.

Hugh Boggs Hawthorne ✠ West Mineral, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1913; served during the World War; aged 46; was found dead, Dec. 24, 1934, of heart disease.

Archibald Nail Dawson ✠ Lakewood, Ohio; Western Reserve University Medical Department, 1908; on the staff of the Lakewood City Hospital; aged 52; died, Dec. 20, 1934, of glioma of the left cerebral hemisphere.

Arthur Fichell Sampson, San Francisco; University of Virginia Department of Medicine, Charlottesville, 1878; member of the California Medical Association; aged 79; died, Nov. 27, 1934, of cerebral hemorrhage.

Clifford Charles Legler ✠ Portsmouth, Ohio; University of Louisville (Ky.) School of Medicine, 1908; on the staff of the Portsmouth General Hospital; aged 50; died, Nov. 25, 1934, of perforated gastric ulcer.

William Montgomery Burnett, Greenville, S. C.; University of Louisville (Ky.) School of Medicine, 1905; member of the South Carolina Medical Association; aged 58; died, January 7, of heart disease.

Robert Gallaher Reynolds Jr., Palo Alto, Calif.; University of California Medical Department, San Francisco, 1903; aged 63; died, Dec. 10, 1934, in the Stanford Hospital, San Francisco, of heart disease.

William Rankin Goley, Graham, N. C.; College of Physicians and Surgeons, Baltimore, 1885; member of the Medical Society of the State of North Carolina; aged 81; died, Nov. 26, 1934, of lobar pneumonia.

Harry Edward Bacon, San Francisco; Denver and Gross College of Medicine, Denver, 1908; aged 53; died, Dec. 16, 1934, in the Mount Zion Hospital, of cirrhosis of the liver and chronic cholecystitis.

Thomas Stephen Augustine O'Connor ✠ Troy, N. Y.; Albany (N. Y.) Medical College, 1903; on the staffs of St. Joseph's Maternity, Troy and Samaritan hospitals; aged 55; died, Nov. 18, 1934.

Paul W. Woods, Atlanta, Ga.; Meharry Medical College, Nashville, Tenn., 1900; aged 52; died, Dec. 27, 1934, in the Grady Hospital, of burns received when the oil stove in his office exploded.

Charles Edward Britto, Stockton Springs, Me.; Hahnemann Medical College and Hospital of Philadelphia, 1899; aged 65; died, Oct. 24, 1934, of coronary occlusion and chronic endocarditis.

Walter C. Hamilton, Kearney, Mo.; College of Physicians and Surgeons of Kansas City, 1879; member of the Missouri State Medical Association; aged 80; died, Dec. 25, 1934, of pneumonia.

William Alfred Strauss, Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1924; aged 38; died, Nov. 22, 1934, in the Laurel (Md.) Sanitarium, of lobar pneumonia.

Alice Hatheway Purvis Robie, Watertown, Mass.; Woman's Medical College of Pennsylvania, Philadelphia, 1898; aged 62; died, Oct. 20, 1934, in Alameda, Calif., of arteriosclerosis.

Joseph Anthony Herb, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1885; aged 75; died, Dec. 27, 1934, of carcinoma of the stomach.

Samuel H. Murphy, Yates Center, Kan.; Eclectic Medical Institute, Cincinnati, 1896; member of the Kansas Medical Society; aged 72; died, Dec. 26, 1934, of carcinoma of the stomach.

Ward Beecher Saltsman, Buffalo; Albany Medical College, 1891; member of the Medical Society of the State of New York; aged 66; died, January 10, of chronic myocarditis.

Sophie Solotareff Solf, Gary, Ind.; Universität Zurich Medizinischen Fakultät, Zurich, 1911; aged 50; died, Dec. 13, 1934, in the Michael Reese Hospital, Chicago, of heart disease.

John Bruffe Kenagy, Rupert, Idaho; Colorado School of Medicine, Boulder, 1906; member of the Idaho State Medical Association; aged 71; died, Nov. 17, 1934, of heart disease.

William Henry Heidorn, Bridgeton, Mo.; St. Louis College of Physicians and Surgeons, 1886; aged 74; died, Dec. 26, 1934, in the Barnes Hospital, St. Louis, of pneumonia.

George S. Hays, Greeneville, Tenn.; University of Tennessee Medical Department, Nashville, 1892; aged 72; died, Dec. 25, 1934, in a local hospital, of cerebral hemorrhage.

Albrecht Otto Eckardt, Rodeo, Calif.; Medizinische Fakultät der Universität Leipzig, Saxony, Germany, 1889; aged 69; died, Dec. 10, 1934, of a tumor of the kidney.

Ida Elizabeth McCormick, Cincinnati; Pulte Medical College, Cincinnati, 1900; aged 68; died, Dec. 30, 1934, in the Bethesda Hospital, of a hip fracture received in a fall.

Henry Paul George ✠ Claremont, N. H.; Baltimore Medical College, 1912; formerly on the staff of the Claremont General Hospital; aged 50; died, January 1, of carcinoma.

Lovell Hampton Harrell, Plant City, Fla.; Tulane University of Louisiana Medical Department, New Orleans, 1910; aged 57; died, Dec. 26, 1934, of chronic nephritis.

Samuel B. McGuire, Dover, Ohio; Baltimore Medical College, 1893; formerly on the staff of the Union Hospital; aged 67; died, Dec. 6, 1934, of pernicious anemia.

David Watt Sheldon, Carmel, Maine; University of Vermont College of Medicine, Burlington, 1898; aged 62; died, Oct. 19, 1934, of thrombosis and arteriosclerosis.

William R. Spooner, Fostoria, Ohio; Baltimore University School of Medicine, 1899; Toledo Medical College, 1903; aged 65; died, Dec. 3, 1934, of bronchopneumonia.

Frederick Wrede, Chicago; Miami Medical College, Cincinnati, 1880; also a druggist; aged 84; died, Dec. 30, 1934, of chronic myocarditis and arteriosclerosis.

John W. Merritt, Center Point, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1899; aged 75; died, Dec. 21, 1934, of arteriosclerosis.

Joseph Price Watson, Hazlehurst, Miss.; Vanderbilt University School of Medicine, Nashville, Tenn., 1903; aged 54; died, Dec. 29, 1934, of heart disease.

John Roger Haynes, Albuquerque, N. M.; University Medical College of Kansas City, Mo., 1893; aged 62; died, Dec. 27, 1934, of diabetic gangrene.

Martin Luther Gettinger, Palestine, Ill.; American Medical College, St. Louis, 1880; aged 76; died, Dec. 20, 1934, in Santa Fe, N. M., of pneumonia.

Harris Weinstein ✠ New York; University of the City of New York Medical Department, 1891; aged 65; died, January 8, of cerebral hemorrhage.

Thomas E. Brents, Ada, Okla.; Reform Medical College, Macon, Ga., 1873; Civil War veteran; aged 88; died, Dec. 29, 1934, of bronchopneumonia.

Addison James Beebe, Sutherland, Neb.; Drake University Medical Department, Des Moines, 1889; aged 86; died, Oct. 30, 1934, of senility.

Clinton Perley Hubbard, South Paris, Maine; Medical School of Maine, Portland, 1884; aged 85; died, Nov. 19, 1934, of arteriosclerosis.

George S. Roberts, Thompsonville, Ill.; Northwestern University Medical School, Chicago, 1892; aged 66; died, Dec. 17, 1934, of pneumonia.

John McCulloch Gourley, Sheet Harbor, N. S., Canada; Halifax Medical College, Halifax, N. S., Canada, 1884; aged 75; died, Dec. 11, 1934.

John H. Wylie, Winnsboro, Texas (licensed in Texas, under the Act of 1907); aged 64; died, Nov. 24, 1934, of bronchopneumonia.

Thomas Gilmore Waller, Lowell, Mass.; Dartmouth Medical School, Boston, 1886; aged 76; died, Dec. 9, 1934, of arteriosclerosis.

Leon Ackerman, New York; New York University Medical College, 1896; aged 65; died, Dec. 22, 1934, of coronary thrombosis.

William James Hagan, Athens, Ala.; Jefferson Medical College of Philadelphia, 1884; aged 72; died, January 1, of pneumonia.

William Lewis Worthington, Camden, Ark. (licensed in Arkansas in 1903); aged 72; died, Dec. 23, 1934, of heart disease.

James T. Mills, Gilmore, Ohio; Columbus Medical College, 1881; aged 81; died, January 2, of heart disease.

Correspondence

TREATMENT OF GONORRHEA IN WOMEN

To the Editor:—Dr. Emily Dunning Barringer in a paper "The Treatment of Gonorrhea in the Female" (THE JOURNAL, Dec. 15, 1934, p. 1825) makes the following statement:

> The greater degree of heat, 130 F. as given by the Elliott machine, seems unwise during the acute stage because of the softening and relaxation of the cervix, thereby opening up one of the natural barriers to the spread of infection.

It is common knowledge that when the gonococci reach the mucous membrane of the cervix or urethra an inflammation is set up. The micro-organisms and their decomposition products stimulate serum exudation diapedesis, leukocytic infiltration and decomposition of fibrin. The interaction between the organism and the micro-organism is the same as for, say, the streptococcus, the purpose of the reaction being localization of the infection, destruction of the micro-organisms and restoration of the injured tissues to normal. Failure of the organisms to localize the infection results in spread and complications. In heat there exists the best means of increasing hyperemia exudation and leukocytosis, and the Elliott machine is an excellent instrument to produce a constant high temperature in the vaginal cavity, an area fortunately tolerant to great heat.

Why should a constant high temperature be beneficial in inflammation elsewhere and contraindicated in acute gonorrheal endocervicitis? Dr. Barringer's reason is that the cervix is softened and the natural barriers are opened to the spread of the infection. It seems incredible to us that the cervix should behave contrary to all other tissues, in response to heat. Heat is universally applied with benefit to localize infection, to seal tissue spaces and to prevent spread of infection. Her statement is contrary to our knowledge of inflammation and the value of heat as a therapeutic agent. It is true that the cervix is softened by the application of strong heat, but the softness is due to increased exudation and increased mucus secretions of the cervical glands.

Dr. Barringer suggests gentle washing of the cervix and topical applications in acute gonorrheal endocervicitis. The cervix, being a glandular structure, harbors the gonococci deep in the glands, and the tissue reaction to this organism is ordinarily very weak. Surface applications are of but little value.

Intense heat is our only means to stimulate and augment the body's own defensive reaction to localize the infection and eradicate the gonococcus. We also wish to add that up to the present we have treated hundreds of cases of acute gonorrhea in the female entirely by the Elliott machine at a temperature of about 130 F. without a single complication.

LEO MICHEL, M.D.,
NORMAN TAUBE, M.D.,
New York.

PINEAL GLAND

To the Editor:—I have read with great interest the editorial on the pineal body (THE JOURNAL, Nov. 24, 1934, p. 1626). My investigations (*Zentralbl. f. Gynäk.* **57**:634 [March 18] 1933) have shown that my extract of the pineal body has an antiestrogenic effect, disturbs the estrous cycle, inhibits the development of weight in infantile mice, and has a therapeutic effect in certain genital bleedings, particularly cases of juvenile bleedings.

CHARLES BURGER, M.D., Budapest.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ANALGESIA IN OBSTETRICS

To the Editor:—What is the entire technic of producing analgesia in obstetric cases at the hospitals in and about Chicago? This includes, I believe, the use of pentobarbital, scopolamine and in some cases apomorphine. Details would be appreciated.

ARTHUR CLAYTON MCCARTY, M.D., Louisville, Ky.

ANSWER.—There are a variety of methods and drugs in use in the hospitals in Chicago for the production of analgesia in labor. Opiates have stood the test of time and are probably the most useful drugs. They can be combined with other drugs, such as scopolamine or magnesium sulphate. The only real objection to the use of an opiate is the likelihood of narcosis of the infant, resulting in asphyxia. This danger is not very great, and asphyxia is not a common occurrence, especially if the drug is used with care at the right time in labor. An accepted technic is as follows:

In primiparas, after the pains have been well established—coming regularly every two or three minutes and lasting from thirty to sixty seconds—and when the cervix is partially effaced and the cervical os dilated to 3 or 4 cm. in diameter, morphine sulphate from 11 to 16 mg., or ⅙ to ¼ grain, depending on the size of the woman (the smaller dose being used in small women), and scopolamine 0.4 mg., or 1/150 grain, are given to the patient. The scopolamine may be repeated at the end of one hour, 0.3 mg., or 1/200 grain, if the patient has not had much relief. As a rule,, following the initial hypodermic injection, the patient begins to doze between labor pains or will sleep for three or four hours. Progress is usually well maintained throughout this period of semiconsciousness, with labor well advanced when the patient is completely aroused from the effects of the analgesia.

A new opiate has been introduced recently in the form of dilaudid (dihydromorphinone hydrochloride). This drug has been used by several obstetricians and has been tried out in a large clinic with excellent results. In fact, in many respects this opiate gives more complete analgesia than morphine sulphate, without apparent interference with the normal physiology of labor. One may use dilaudid 2 mg., or 1/32 grain, with scopolamine 0.3 mg., or 1/200 grain, given about the same time as in the case just described. Dosages as high as 3 mg., or 1/20 grain, have been recommended, but the smaller dose has been entirely satisfactory. In multiparas, either opiate may be given earlier in labor than in primiparas.

When dilatation is complete, analgesia may be provided by inhalation of nitrous oxide and oxygen or ethylene and oxygen during the pains. The mask is placed on the patient's face when the pain begins, and she inhales several deep breaths until the height of the pain is reached, and then as the pain subsides the mask is removed. Either gas may be given for as long as two hours without any danger to the patient. Drop ether, likewise, may be used for analgesia during the second stage of labor. This is used with an open mask over the face during the pain and removed after it subsides.

Pentobarbital sodium has become popular recently for the production of analgesia in labor. It is given according to the following method: When labor is well established and the cervical os is dilated to 3 or 4 cm. in diameter, 0.5 Gm., or 7½ grains, in capsules may be given by mouth to the patient of average weight. In another twenty minutes the patient is given scopolamine 0.4 mg., or 1/150 grain, hypodermically. The patient may sleep or only doze between pains, but the uterine contractions continue satisfactorily. Although she may not doze continuously during the analgesia, often she does not remember what has happened when labor has been completed; almost complete amnesia may be produced.

A host of other drugs have been recommended from time to time for analgesia in labor. Many of them are not satisfactory from the standpoint of interfering with the uterine activity, causing prolonged labor and resulting in operative intervention. Other drugs do not provide the degree of relief demanded by patients in labor. To be an ideal analgesic, the drug must not interfere with uterine motility. It must be safe for the mother and likewise for the baby.

Asphyxia of the baby resulting from morphine is best treated by inhalation of carbon dioxide and oxygen. Carbon dioxide may reach a concentration of 30 per cent in oxygen if it is

used for only a few seconds. The initial efforts at resuscitation are usually sufficient and this concentration of the gas may be followed by 5 per cent carbon dioxide in 95 per cent oxygen.

Apomorphine 2 mg., or 1/30 grain, has been advised as a mild sedative. It is not satisfactory as an analgesic in labor.

Further details on narcosis and methods of resuscitation are given by Shute, Evan, and Davis, M. E.: Effect on the Infant of Morphine Administered in Labor, *Surg., Gynec. & Obst.* **57**:727 (Dec.) 1933.

TIN OR LEAD POISONING IN INDUSTRY

To the Editor:—A man, aged 32, in excellent physical condition, had had no serious illnesses and no gastro-intestinal complaints whatever until three years ago. At that time (his occupation being that of a mechanic) he was called on to do a soldering job, which took nearly four days of continuous work and was done in a poorly ventilated room. The day on which the work was completed he suddenly became distended with gas, had severe abdominal cramps, suffered from constipation, and vomited several times. He consulted a physician, who treated him for several weeks, during which time he became only moderately better and was finally referred to a specialist. Here he was given a complete gastro-intestinal series of roentgenograms, including gallbladder visualization, and a gastric analysis. All of these were negative. He was placed on a milk diet for over a month with no relief. Since that time he has had modified versions of the original attack with distention, abdominal distress and constipation about every three months, lasting from a month to two months. In the intervals he is comparatively well. Physically he is of robust build and entirely negative to physical examination, with only a moderate general tenderness to palpation throughout the abdomen. The Wassermann reaction, the blood both on count and smear, and the urine are negative. The stool is negative to two examinations. Is there any possibility that lead or tin poisoning might have been contracted during his prolonged soldering job? Would not the milk diet have given him some relief had that been the case? Are there any suggestions as to diagnosis or further diagnostic procedure in this case? Please omit name and address.

M.D., California.

ANSWER.—Tin poisoning is always doubtful as an occupational disease entity. On the other hand, the possibility of lead poisoning is greater, but neither the circumstance of exposure nor the disease manifestations as described warrant any belief that lead poisoning took place. The development of a full blown lead poisoning on the fourth day of exposure to lead is not well precedented. If recent previous exposures to lead antedated this exposure period of four days, lead poisoning becomes more of a possibility. Careful blood examination, including basophilic aggregation tests, may be of some value. Single examinations of the urine or feces for lead are without distinct value, since some lead normally may be present. The finding of stipple cells, low hemoglobin and low total red count would have some positive value but, of course, are not conclusive. The development of lead poisoning from the fumes of molten lead is relatively much rarer than the causation of this disease by lead dust or lead paste. Cases of the character described are not infrequent among metal workers. Ordinarily they represent nonindustrial diseases that have been precipitated by exposure to mixed vapors and gases from heating units, from fluxes or from the metal itself, no one of which is capable of producing a characteristic disturbance in such operations as soldering or welding. Future diagnostic search should be directed to the ruling out of lead poisoning, decision as to which should not rest on any one or two tests but on complete examination of the blood, musculature, gum discoloration, and so on.

HYPERTHYROIDISM

To the Editor:—A white man, aged 40, was diagnosed roentgenologically tuberculous around an old scar in the right apex. There is no cough or sputum. The afternoon temperature ranges from 99 to 99.2 F. Following two weeks in bed, symptoms of muscular weakness and exhaustion, tremors, twitching, restlessness and insomnia are much worse. He has a very large normal appetite and during this time has lost about 5 pounds (2.3 Kg.). His mind is clear and active, but he is very depressed. The basal metabolic rate is +35. The thyroid is not tender or enlarged, nor is there any exophthalmos. 1. With a questionable diagnosis of active tuberculosis, is iodine contraindicated? 2. With a positive diagnosis of a mild tuberculosis, is iodine contraindicated? 3. Is high voltage roentgen therapy of more benefit than iodine? 4. If the patient should become a good operable risk would you advise vessel ligation or partial or total thyroidectomy?

JAMES S. MILLIKEN, M.D., Southern Pines, N. C.

ANSWER.—On the facts stated, the illness of this patient is in all probability hyperthyroidism. The scar at the right apex disclosed by roentgen examination may be due to an old pulmonary or pleural infection long since healed and of no clinical significance in the present illness. It is of course remotely possible that hyperthyroidism and tuberculosis exist together, but in this event it is certain that such tuberculosis as is present is playing but a minor part in the production of symptoms. Loss of weight in the presence of a good appetite, while highly suggestive of hyperthyroidism, should also suggest the examination of the urine to exclude diabetes mellitus.

1. The use of small doses of iodine is indicated. The probable favorable effects on the hyperthyroidism far outweigh the remotely possible ill effects on the minimal and probably inactive scar at the right apex.

2. With a positive diagnosis of mild tuberculosis (in which case more evidences of active tuberculosis would be required than are here given) the use of iodine would raise serious questions. It is believed by many clinicians that iodine favors the absorption of scar tissue, especially in granulomas, and that tuberculosis which heals by scarring and encapsulation of tuberculous lesions is unfavorably affected by iodine.

3. Roentgen therapy has been used extensively in hyperthyroidism, with many favorable results. In most cases iodine, followed by appropriate surgical treatment, is at present preferred to roentgen treatment. In a number of mild cases of hyperthyroidism, iodine therapy is sufficient.

4. After adequate treatment with rest, a full diet and iodine, surgical measures may also be necessary. The choice of operative procedures will depend on the condition of the patient. In marked cases of hyperthyroidism, subtotal thyroidectomy is usually recommended. Ligation of vessels alone is sometimes done, usually in severe cases in which a more extensive operation cannot safely be done, or as a preparation for later resection of the gland.

DIAGNOSIS OF ALLERGY

To the Editor:—A well nourished and well developed girl, aged 15 years, who comes from a definitely allergic family, developed facial impetigo contagiosum about ten weeks ago. A standard prescription of dilute aluminum subacetate soaks was ordered, to be followed by inunctions of 10 per cent ointment of ammoniated mercury. In a few days the child's face became uniformly swollen and the vesicular and pustular impetiginous lesions became bullous. The mercury ointment was stopped and boric acid soaks substituted for the solution of aluminum subacetate, and calcium lactate and ephedrine by mouth were instituted. The bullous lesions gradually subsided and the edema slowly disappeared, but there followed a series of angioneurotic explosions, which have persisted to date. On one occasion both buttocks became symmetrically indurated and swollen, with a picturesque gyrate border extending down both thighs and legs. Then giant hives appeared and disappeared. Succeeding crops of hives were smaller in individual size and of shorter duration. When it appears as if the "explosion" is dying out, the next event is swelling of the extremities or one side of the face. An intercurrent otitis media developed following a mild nasopharyngitis, which required paracentesis. About half an hour following the administration of ethyl chloride by inhalation the lips and face became markedly swollen. This attack lasted about ten hours. The physical examination is otherwise negative. The blood picture, Kahn reaction, phenolsulphonphthalein test and urinalysis are normal. A competent dentist has ruled out dental infection. The tonsils are out clean. I did a series of scratch tests without any positives. Incidentally, the scratch marks produced only a slight amount of residual dermatographism. What additional procedures would you advise in an effort to get at the bottom of this case? Please omit name.

M.D., Michigan.

ANSWER.—Apparently there are two separate stages in this case. The first event was a dermatitis, possibly due to sensitiveness by contact. The second stage consists of a series of superficial and deep forms of urticaria. This phase is more likely due to an internal source of sensitization. It is difficult to account for the sequence of these two stages. It is possible that the inflammation of the skin has allowed the entrance of products, particularly bacterial or fungous, into the body so that subsequent exposure to organisms (respiratory, intestinal) may cause an allergic flare-up. Contact causes, foods and bacterial sensitization must therefore be considered.

To determine the factors responsible for the dermatitis, ordinary scratch tests are usually of no value. One must do a series of patch tests. A small piece of the material is placed on a separate piece of gauze about an inch square. If the material is dry it may be moistened with liquid petrolatum. This "patch" is applied with the testing material next to the surface of the skin. The gauze is then covered with a square of oiled silk and fastened to the skin with adhesive tape. Several patches may be applied to the back at one time and examined after from twenty-four to forty-eight hours. A positive reaction will consist of itching and redness, if more severe going on to edema and vesiculation. In the case cited one would have to test in this manner the chemicals that had been used, the ointment base, wool, cotton and silk.

In addition to the foregoing the cause of the urticaria will probably require further search. The scratch tests should be as complete as possible and if all are negative they should be tried further by the intradermal method. In the event that the latter are negative, one may still assume that a food may

be the cause of the urticaria. Experimental diets such as elimination diets described elsewhere are in order (Feinberg, S. M.: Allergy in General Practice, Philadelphia, Lea & Febiger, 1934. Rowe, A.: Food Allergy, Lea & Febiger, 1931). If foods are not found to be at fault, a more thorough search for infection must be made—intestinal, gallbladder and so on. At times the basal metabolic rate is found to be lowered.

SCROTAL TONGUE

To the Editor:—In my clinical experience over many years I have often seen furrowed or scrotal tongues of varying degree in apparently normal persons. They have caused me to wonder what causes such a tongue. My first chronic case was a cretin whose tongue was deeply furrowed and scrotal in appearance. He responded well to thyroid treatment but his tongue never changed. His father had a medium scrotal tongue but was not a cretin. I have seen many such tongues in apparently normal persons but have never seen any opinion expressed as to the probable cause. In more recent years, since studying endocrinology and its relation to subacute and chronic arthritis, I have found that the scrotal tongue is quite common in women and a few men, who are generally suffering from hypothyroidism. I have noticed these patients improve on liberal doses of thyroid. I have been looking on these scrotal tongues as cases of hereditary hypothyroidism. I saw one woman, aged 30, who has suffered for years from chronic rheumatoid arthritis in her hands, knees and feet. She went through a normal pregnancy and confinement and gave birth to a normal child that does not show a scrotal tongue. She was on thyroid, 1 grain (0.065 Gm.) twice daily, during her pregnancy. Her mother shows a medium scrotal tongue and has a mild case of rheumatoid arthritis. I should like your opinion as to the cause of scrotal tongue.

F. A. BOOTH, M.D., Seattle.

ANSWER.—Scrotal tongue (lingua plicata) is usually congenital and often familial. The tongue is nearly always larger than normal; the enlargement may be very marked. Milder forms of furrowed tongue are fairly common. The condition is permanent and of no special significance except when food particles collect in the crevices and cause irritation, which, if recurrent, may predispose to epithelioma. There is no evidence that hypothyroidism is an etiologic factor. An acquired form of grooved tongue may follow various forms of glossitis or be due to other disease, notably syphilis. Oversize of the tongue may predispose to the formation of sulci or may aggravate the condition. In marked thyroid deficiency (myxedema and cretinism) the tongue is large and thick but it rarely shows the fluted appearance characteristic of the scrotal tongue. If treatment of the hypothyroidism is neglected or ineffectual, the chronic enlargement may predispose to the appearance of grooves. Otherwise there is no recognized connection between hypothyroidism and the scrotal tongue.

DOUBTFUL DIAGNOSIS OF SYPHILIS

To the Editor:—A white man, aged 34, married, has been under my care. In 1918, complicating a severe attack of influenza, the patient developed bronchiectasis. At present he expectorates from one-half to 1½ ounces of purulent sputum each twenty-four hours. An injection of iodized poppy-seed oil in 1926 revealed a bilateral bronchiectasis. Laboratory examination of the sputum revealed spirochetes, and neoarsphenamine was given, 0.3, 0.45 and 0.45 Gm. at weekly intervals. The third dose of 0.45 Gm. caused a slight reaction and the drug was discontinued. In 1924 the blood Wassermann and Kahn reactions were negative. The patient was married in 1930. In February, a year later, one morning following coitus he noticed a small reddened macular area the size of a pea on the corona. Three weeks later a blood Wassermann reaction was Kolmer 3 plus, Kline negative. Neoarsphenamine was begun and 0.3, 0.45, 0.6, 0.45, 0.45, 0.45 and 0.45 Gm. were given at weekly intervals. Between the sixth and seventh injections, Kolmer and Kline reactions were negative. There was a slight reaction to the 0.6 Gm. dose, so that is why the 0.45 Gm. doses were continued. The reports on Kolmer and Kline tests were negative for a month afterward; then the Kolmer became 2 plus again, with a negative Kline. At the same time a sample of the same blood was sent to another laboratory and the report was a negative blood Wassermann reaction and negative Kahn. The blood reports have been negative with no treatment until two weeks ago, when a report of a blood Wassermann reaction was +, and Kahn negative. The Kline and Kahn reactions have always been negative, with a marked variation in the Kolmer and Wassermann, at two different laboratories. There is no history of outside exposure, and repeated blood tests on the wife have been negative. There has never been any clinical evidence of syphilis except the atypical lesion mentioned. Recently there has been noticed a scaly appearance over the site of the old lesion, but it does not look like a syphilitic condition. Please tell me whether or not this is syphilis; if it is, outline the course of the treatment. Would you advise spinal puncture? Please omit name.

M.D., South Carolina.

ANSWER.—This is an excellent illustration of the danger of treating a patient for syphilis without having an absolutely definite diagnosis. The basis for the original diagnosis on which treatment was instituted was hardly adequate for a diagnosis. No examination for spirochetes having been made, one cannot say whether or not the lesion described was of syphilitic origin. With only one Kolmer type of Wassermann reaction positive, and a negative Kahn, one cannot eliminate the possibilities of error and, following the treatment that he received, might conceivably have been sufficient to change the reaction in the case of syphilis, although this is not too likely. The subsequent results are confusing but by no means definitely indicative of syphilis. The fact that the wife shows no signs of syphilis makes it extremely doubtful that the original lesion was of syphilitic nature. One can only have a conjecture about the case, which is that the man probably has not had syphilis.

The procedure that would seem wise would be to have about a dozen tests made in succession in a reliable laboratory. This would give one a pretty good indication of the present condition. If the tests are uniformly negative with a sensitive test such as the Kline test well carried out, and if this is backed up by negative Kahn and Wassermann tests, one would have justification for feeling that no further treatment is indicated, although rechecking at intervals of six months to a year would be a reasonable procedure.

If for any reason one is not thoroughly satisfied that the results of the tests show the absence of syphilis, treatment should be vigorously given for a period of a year.

DERMATITIS IN ENGRAVING INDUSTRY

To the Editor:—I recently saw a white man, aged 50, a printer, who has been working in the engraving department during the past two months, using a fine aluminum dusting powder, which at the end of the day's work covers his face and hands and is inhaled into his mouth and nostrils. Recently there have developed about his face, scalp, chest, back and arms isolated bright red protruding petechial lesions varying from a pinhead to a lentil in size and about a dozen in all. There are no other symptoms and the lesions themselves are symptomless. When one ruptures there is protracted bleeding, one having bled an hour and a half according to the patient's statement. A crust then formed but the lesion does not vanish but may later bleed again. There is slight induration about some of the lesions that have previously ruptured. The first lesion was on the eyelid and was cauterized by a physician. The patient feels generally well: "Never better in my life," he states. No other hemorrhagic manifestations have been noted and the past history is negative. Examination is essentially negative except for the lesions, which are confined to the areas described and are not found elsewhere. The patient had a slight fever, 99.4 F., when the first time in my office. The pulse was 76, respirations 18 and the blood pressure 130 systolic, 90 diastolic. His height is 5 feet 6 inches (167.6 cm.), his weight 153 pounds (69 Kg.). He has several carious teeth but the gums do not appear abnormal. There is no lead line or hemorrhagic area. Stereoscopic views of the lungs were negative. Laboratory study of the urine gave negative results. A stool specimen was strongly positive for occult blood. The Wassermann reaction was negative. The bleeding time was one minute. The coagulation time was three minutes. Blood examination revealed red blood cells 5,460,000, hemoglobin 105 per cent, white blood cells 13,150, of which 30 per cent were small lymphocytes, 4 per cent large lymphocytes and 63 per cent polymorphonuclears. Platelets numbered 121,000. A recheck on the blood study after two days made by a second laboratory differed slightly from the first and was as follows: red blood cells 5,120,000, hemoglobin 90 per cent, white blood cells 6,400, polymorphonuclears 69 per cent, lymphocytes 26.5 per cent, monocytes 2.5 per cent, eosinophils 2 per cent. The platelet count was reported to be normal. In your opinion might this condition have been related to the patient's occupation either as an engraver using the aluminum powder or in his occupation as a printer in contact with various printers' inks or lead? His employer informs me that the powder which the patient has been using during the past two months and in which time these lesions have appeared is a fine aluminum powder and contains no other metal. Please omit name.

M.D., California.

ANSWER.—The aluminum powder described in this query has proved to be almost innocuous in the causation of any occupational disorder, although a number of spurious claims have been made alleging various forms of damage. Occasionally enough lead is present as an impurity in the aluminum to result in a diagnosis of lead poisoning as the result of exposure. The dyes used for the making of colored metallic dusting powders have been regarded with suspicion as a source of dermatitis. Local mechanical action has occasionally led to lesions about the face. The dermatosis described may not readily be attributed to the action of this aluminum powder. If of occupational origin at all, greater significance perhaps is to be attributed to other substances used in the engraving and print shop, such as various inks, glues for binding aluminum bronzes, and distillates employed in the cleaning of presses and type. However, it is not known that this type of lesion may be ascribed to any of the substances contemplated. Some benzene may be used for cleaning purposes and in glues used in printing establishments, but the results of the blood examinations seem to rule out the likelihood that this hemorrhagic nodulation may be attributed to benzene or related substances. It is quite within reason to believe that disturbance of nonoccupational origin might be aggravated by dusty and liquid substances found about a printing plant, but no warrant is known to exist to lay the blame on work as the primary cause.

Without attempting any diagnosis, the suggestion is made that this disorder may be of the character of an erythema nodosum or at least one of those entities similar to erythema nodosum. Also there exists the possibility that the lesions may represent the invasion by fungi or other vegetable parasites, cases of which are appearing with a fair frequency at this time.

CARCINOMA OF THE APPENDIX

To the Editor:—Recently my wife, aged 22, developed acute appendicitis, and appendectomy was done. Gross examination of the appendix at the time of removal showed acute inflammation with congested serosa of the distal third. A specimen was sent to the laboratory for further study. Laboratory diagnosis was that of carcinoid appendix with invasion into the muscle and extending to the serosa with small invasion into the meso-appendix. The carcinoid had blocked the lumen of the appendix in the proximal third and also there was present an acute inflammation. What are the possibilities of malignancy and what treatment, if any, would you suggest be instituted? Please omit name. M.D., Ohio.

ANSWER.—Carcinoid tumors of the appendix are differentiated microscopically from carcinomas of the appendix in that the former contain (1) strands or cords of argentaffine cells, (2) few mitotic figures, and (3) an alveolar but never glandular arrangement of cells. Carcinoid occurs usually before the third decade in contrast to carcinoma, which is most common after the third decade. More than 92 per cent of carcinoids occur in the distal half of the appendix, while carcinoma of the appendix is usually found in the proximal portion and is primarily from the cecum. These facts are consistent with the diagnosis of carcinoid in the case in question.

The reported evidence on this subject indicates that, in appendixes removed for appendicitis per se, 0.46 per cent are found to contain carcinoid tumors, and that from 2 to 6 per cent of these cases may show evidence of malignancy, such as extension, metastasis or surrounding glands or recurrence.

Surgery usually suffices to cure this condition. Being of neurogenic origin, these tumors are probably resistant to radiation, although a preliminary review of the literature fails to reveal any data on the radiotherapy of this condition. If careful gross and microscopic study of the removed specimen indicates that the excision extends outside the area of disease, a cure has in all likelihood been effected. The age of the patient and the probable radioresistant nature of the lesion contraindicate any form of radiotherapy in this case. On account of the chances of malignancy being so small, a second surgical procedure is contraindicated.

EFFECTS OF PHENOL ON TYMPANUM

To the Editor:—Several months ago I heard a story about an intern who once injected subcutaneously pure phenol in place of procaine, which he had really intended using. I little realized that I could be guilty of such absent-mindedness. Intending to instill several drops of a 5 per cent phenol-glycerin solution into an external auditory canal which I had just cleaned of impacted cerumen, I squirted instead several drops of pure phenol into the ear. The patient, of course, immediately complained of a severe burning sensation in the canal but it was not until about one and one-half or two minutes later that I realized the stupidity of my error. I quickly syringed out the canal, first with warm water followed by an abundance of 70 per cent alcohol. This gave the patient some relief and a few minutes later I instilled several drops of the 5 per cent phenol-glycerin solution in the patient's ear. I then gave him a prescription for this solution and advised him to use several drops in his ear three times daily. Before the phenol was inserted I had noticed that the drum was intact. After washing out as much of the phenol as I could, I inspected the drum, which fortunately was still intact, but the outer lining of the drum was of a dull white color and there was no glistening appearance. I have not seen the patient again as yet. Will you tell me whether the drum will become necrotic? Will the hearing in this ear become affected? What subsequent treatment would you advise? Please omit name.

M.D., New Jersey.

ANSWER.—The application of a concentrated phenol solution to the drum membrane causes the epithelium to become white just as it does if applied to the epidermis, elsewhere. The use of alcohol immediately after the accidental use of the pure phenol probably stopped its caustic action. It is quite likely, therefore, that there was complete recovery, and no destruction of the drum membrane itself, and no perforation.

It is certain that, if only the surface of the drum membrane was involved, no impairment of hearing took place. There was no subsequent treatment that could have been applied. If there was only a superficial involvement of the drum membrane, even if the patient had been seen directly after, no special treatment would have been necessary. If there had been prolonged action of the phenol with any necrosis of the drum membrane, nothing could have been done except the use of alcohol or oil at the time.

Medical Examinations and Licensure

COMING EXAMINATIONS

ALASKA: Juneau, March 5. Sec., Dr. W. W. Council, Juneau.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written (Group B candidates).* The examination will be held in various cities of the United States and Canada, March 23. *Final oral and clinical examination (Group A and Group B candidates).* Atlantic City, N. J., June 10-11. Group B application lists close Feb. 23 and Group A application lists close May 10. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 8, and New York, June 10. *Application must be filed at least sixty days prior to date of examination.* Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Atlantic City, N. J., June 10, and St. Louis, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

ARIZONA: *Basic Science.* Tucson, March 19. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

CALIFORNIA: *Regular.* Los Angeles, Feb. 4-7. *Reciprocity.* Los Angeles, March 13. Sec., Dr. Charles B. Pinkham, 420 State Office Building, Sacramento.

CONNECTICUT: *Basic Science.* New Haven, Feb. 9. *Prerequisite to license examination.* Address, State Board of Healing Arts, 1895 Yale Station, New Haven. *Regular.* Hartford, March 12-13. *Endorsement.* Hartford, March 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* March 12. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

MAINE: Portland, March 12-13. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton Jr., 192 State St., Portland.

MASSACHUSETTS: Boston, March 12-14. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 144 State House, Boston.

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* The examinations will be held in medical centers where there are five or more candidates, Feb. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEVADA: *Reciprocity.* Feb. 4. Sec., Dr. Edward E. Hamer, Carson City.

NEW HAMPSHIRE: Concord, March 14-15. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

OKLAHOMA: Oklahoma City, March 12-13. Sec., Dr. J. M. Byrum, Mammoth Bldg., Shawnee.

PUERTO RICO: San Juan, March 5. Act. Sec., Dr. Ramón M. Suarez, Box 536, San Juan.

VERMONT: BURLINGTON, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

WEST VIRGINIA: Charleston, March 18. State Health Commissioner, Dr. Arthur E. McClue, Charleston.

WISCONSIN: *Basic Science.* Madison, March 16. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Feb. 4. Sec., Dr. W. H. Hassed, Capitol Bldg., Cheyenne.

Iowa Reciprocity and Endorsement Report

Mr. H. W. Grefe, director, Division of Licensure and Registration, reports 8 physicians licensed by reciprocity and 1 physician licensed by endorsement from Sept. 15 to Oct. 25, 1934. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Stanford University School of Medicine		(1928)	Colorado
Northwestern University Medical School		(1929)	S. Dakota,
		(1931)	Kansas
Rush Medical College		(1923)	Illinois
University of Louisville School of Medicine		(1933)	Kentucky
University of Nebraska College of Medicine		(1929)	Nebraska
University of Pennsylvania School of Medicine		(1933)	N. Carolina
Vanderbilt University School of Medicine		(1922)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Northwestern University Medical School		(1934)	N. B. M. Ex.

Georgia Reciprocity and Endorsement Report

Mr. R. C. Coleman, joint secretary, State Examining Boards, reports 5 physicians licensed by reciprocity and 2 physicians licensed by endorsement from June 18 to Oct. 11, 1934. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Loyola University School of Medicine		(1934)	Maine
Northwestern University Medical School		(1934)	Texas
University of Kansas School of Medicine		(1933)	Kansas
Johns Hopkins University School of Medicine		(1928)	Maryland
Meharry Medical College		(1933)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Washington University School of Medicine		(1925), (1928)	N. B. M. Ex.

Michigan June Examination at Ann Arbor

Dr. J. Earl McIntyre, secretary, Michigan State Board of Registration in Medicine, reports the written examination held at Ann Arbor, June 6-7, 1934. The examination covered 14 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Yale University School of Medicine		(1932)	84.7
Northwestern University Medical School	(1933) 86.4,	(1934)	82.5*
Rush Medical College		(1934)	85.4†
University of Illinois College of Medicine		(1934)	82.6
Indiana University School of Medicine		(1933)	83
Johns Hopkins University School of Medicine		(1932)	87.7†
Harvard University Medical School	(1933) 85.8,†	(1934)	83†
University of Michigan Medical School		(1931)	84.2,
(1934)‡ 79.9, 80.2, 80.4, 80.7, 80.8, 80.8, 80.9, 80.9, 80.9, 81.3, 81.4, 81.5, 81.5, 81.6, 81.6, 81.8, 81.9, 82, 82, 82.3, 82.4, 82.4, 82.5, 82.5, 82.6, 82.6, 82.6, 82.7, 82.8, 82.8, 82.8, 82.9, 83, 83, 83.1, 83.2, 83.2, 83.2, 83.2, 83.3, 83.3, 83.4, 83.4, 83.4, 83.5, 83.5, 83.5, 83.5, 83.6, 83.6, 83.9, 83.9, 84, 84.1, 84.1, 84.1, 84.2, 84.2, 84.3, 84.4, 84.6, 84.6, 84.6, 84.7, 84.7, 84.8, 84.8, 84.8, 84.9, 85, 85.1, 85.1, 85.3, 85.4, 85.7, 85.9, 85.9, 85.9, 86, 86, 86.2, 86.3, 86.4, 87.7			
University of Minnesota Medical School		(1929)	84.2
Marquette University School of Medicine		(1934)	81.7,
85, 85.2, 85.7,* 85.9*			

* This applicant has completed his medical course and will receive his M.D. degree on completion of internship. License has not been issued.
† License has not been issued.
‡ Licenses have not been issued.

Michigan June Examination at Detroit

Dr. J. Earl McIntyre, secretary, Michigan State Board of Registration in Medicine, reports the written examination held at Detroit, June 13-14, 1934. The examination covered 14 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and eleven candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine		(1934)	81.9*
Loyola University School of Medicine		(1934)	82.2
Northwestern University Medical School		(1934)	81.2,
83.6,* 85.9			
Rush Medical College	(1933) 83.9,*	(1934)	84.5
University of Illinois College of Medicine		(1934)	82.7, 83.5*
Tulane University of Louisiana School of Medicine		(1933)	85*
University of Michigan Medical School		(1933)	84.5
Wayne University College of Medicine		(1933)	78.6,
(1934) 78,† 78.5,† 79,† 79,† 79.3,† 80.3,† 80.5, 80.9, 81.2,† 81.3, 81.4,† 81.6,† 81.7, 81.7,† 82.1, 82.1, 82.1, 82.2,* 82.2,† 82.6,† 82.8, 82.8,† 82.9,† 82.9,† 83,† 83.1,† 83.2, 83.2,† 83.4,* 83.5,† 83.6,† 83.6,† 83.6,† 83.6,† 83.7,* 83.7,† 83.7,† 83.7,† 83.7,† 83.8,† 83.9, 83.9,† 84,† 84.1, 84.2,† 84.2,† 84.3,* 84.3,† 84.3,† 84.3,† 84.4,† 84.4,† 84.5, 84.5,† 84.5† 84.5,† 84.5,† 84.6,† 84.7, 84.7,† 84.8, 84.8,† 84.8,† 85,† 85,† 85,† 85.1,† 85.2,* 85.3,† 85.5, 85.5,† 85.5,† 85.5,† 85.6, 85.6,† 85.7, 85.7, 85.9,† 85.9,† 86.1,† 86.1,† 86.2,† 86.2,† 86.2,† 86.3,† 86.4, 86.4,† 86.5, 87.8†			
University of Minnesota Medical School		(1932)	83.8,
(1933) 85.4, (1934) 84*			
St. Louis University School of Medicine		(1933)	83.6
New York University, University and Bellevue Hospital Medical College		(1933)	83.3
Woman's Medical College of Pennsylvania		(1933)	79.3
University of Toronto Faculty of Medcine		(1930)	85.6
University of Western Ontario Medical School		(1932)	83,
(1934) 84.6*			
McGill University Faculty of Medicine		(1924)	84.9

* License has not been issued.
† This applicant has received his M.B. degree and will receive his M.D. degree on completion of internship. License has not been issued.

Nevada November Examination

Dr. Edward E. Hamer, secretary, Nevada State Board of Medical Examiners, reports the written examination held in Carson City, Nov. 5, 1934. The examination covered 11 subjects and included 110 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. Two physicians were licensed by reciprocity after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Maryland Medical College		(1906)	82.1
St. Louis University School of Medicine		(1925)	76.7
Jefferson Medical College of Philadelphia		(1918)	82.6

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Illinois College of Medicine		(1930)	Illinois
Baltimore Medical College		(1909)	New York

Book Notices

An Introduction to Gynecology. By C. Jeff Miller, M.D., Professor of Gynecology, Tulane University School of Medicine. Second edition. Cloth. Price, $6. Pp. 354, with 121 illustrations. St. Louis: C. V. Mosby Company, 1934.

No teacher of gynecology can be expected to be completely satisfied with any single gynecologic textbook unless perchance he has written it himself. Over a period of years the author carefully sifted out from a number of sources the data best suited to his own methods of teaching. He has collected and organized these data. In the review of the first edition in THE JOURNAL it was regretted that Miller has so frequently borrowed in preference to drawing from his own broad sources. There is room here for a difference of opinion. Miller has done well to use for his teaching needs the instrument best adapted, regardless of source. Never with any thought of self aggrandizement, his tone is consistently simple, unassuming, modestly and helpfully instructive. The text is completely shorn of nonessentials. Elimination of personalities, fads and fancies gives it an enviable consistency and an even distribution of subject matter. There is no topheaviness and unevenness begotten of personal hobbies and axes to grind. The book is far from striking in its immediate effect. It presents, for the most part, fundamental run-of-the-mill teaching gynecologic material. It may well be said that its chief virtue lies rather in its manner of presentation than in any conspicuous virtue or originality in its intrinsic makeup. Objection has also been raised to the lack of originality in the author's selection of illustrations. This objection should be flatly overruled in view of the consistent selection of good illustrations. Cuts of time proved value, some even of hackneyed old favorites, offer clear proof of the unostentatious devotion to the art of gynecologic teaching. Much is to be said for those who have sufficient insight to realize that the teaching of gynecology may best be approached from a number of different angles. Some reviewers have lamented the absence of simple fundamental gynecologic concepts in more advanced textbooks and reference works; others signalize the failure of such fundamental works as Miller's to present advanced research phases, surgery and the clinical technic of treatment. The trend toward separation of the various phases of this broad subject is an excellent one. There can be no question that the segregation of this material for teaching purposes is rational. Certainly by comparison Miller's book seems rather brief, perhaps elementary; yet if a student will assimilate a reasonable proportion of its sound teaching he will have obtained an adequate grounding for later research and the building of clinical knowledge—and without the grinding ordeal of sorting out for himself what is essential to this fundamental grounding. Miller offers a simple but nourishing diet for the student's mental digestion, a digestion not trained to discretion in the selection of a sufficiently simple fare for its own consumption.

Schistosomiasis (Bilharziasis). By Dr. Rameses Girges. With a foreword by Professor Ernest Carroll Faust. Cloth. Price, 25s. Pp. 529, with 185 illustrations. London: John Bale, Sons & Danielsson, Ltd., 1934.

This volume represents the most complete single account of schistosomiasis now available. There are ten parts, each with from one to six chapters. Part I is an introductory historical account of the development of the present knowledge of schistosomiasis. Part II deals with the parasitology of the family Schistosomidae. Part III gives a summary of the present geographic distribution and the factors in the epidemiology of the human types of the disease. Part IV is a useful compendium of practical methods for the study of the parasites, including a description of the molluscan intermediate hosts. Of particular interest from the medical standpoint are parts V, VI, VII and VIII, which deal with schistosomiasis haematobium, schistosomiasis Mansoni of the intestinal type, schistosomiasis Mansoni of the visceral type and schistosomiasis japonicum, respectively. Under each infection a careful outline is given of the pathology, clinical aspects, prognosis and treatment, both medical and surgical. The division of schistosomiasis Mansoni into intestinal and visceral types is of particular interest. The intestinal type is the orthodox, clinical picture ascribed to

Manson's schistosomiasis. The visceral type is the syndrome of hepatic cirrhosis, splenomegaly and ascites, which is generally termed Egyptian splenomegaly and is usually considered of unknown etiology. The author has collected a tremendous series of clinical, pathologic and parasitologic data indicating that this disease is due to unisexual infections with the male Schistosoma Mansoni. The male cercariae reach the liver and grow to maturity but, finding no females or an insufficient number, do not migrate to the mesenteric region, where oviposition usually occurs. In the meantime their presence in the liver incites an immunity which prevents the development of female cercariae even if these are later acquired by the patient. The fact that this condition is a schistosomiasis has been missed largely because there are no eggs found in the feces or urine. Part IX is a general survey of specific treatment and emphasizes the great advances made since the introduction of the antimonial preparations. Part X gives a short discussion of prophylaxis. The author has had an amazing contact with clinical cases of the Mansoni and haematobium types of the disease, and the book is the result of this experience plus a very thorough biologic grounding. The book is well written and illustrated and will be indispensable to all clinicians, sanitarians and parasitologists interested in this group of trematodes. It is to be regretted that the author compiled no extensive bibliography, although frequent references are cited throughout the text.

Diseases of Women. By Ten Teachers Under the Direction of Comyns Berkeley, M.A., M.D., M.C., Obstetric and Gynæcological Surgeon to the Middlesex Hospital. Edited by Comyns Berkeley, J. S. Fairbairn and Clifford White. Fifth edition. Cloth. Price, $6. Pp. 568, with 193 illustrations. Baltimore: William Wood & Company, 1934.

Peculiarly enough this book, though written by ten different men, possesses remarkable consistency. It is thoroughly reliable, well grounded in authority, and consistently solid (almost stolid). It is thoroughly British in its devotion to unenlightened detail—a virtue, no doubt, in an academic teaching textbook. Blunt British parlance brings forth apt expressions such as "slop diet" for "soft diet," "plugging" the uterus for "packing," and "enquiry" instead of "inquiry," with a liberal smattering of diphthongs. No method is superior for teaching purposes to that used in this work. The orderly presentation of etiology, pathology, symptoms, diagnosis, treatment and prognosis is exemplary. Granting the value of such orderly sequence, one is surprised to note a lack of balance in the total consideration allotted to various general subjects. Ectopic pregnancy, for example, and uterine fibroids are treated in great detail (except for micropathology). An exhaustive reference work could hardly be expected to contain a more adequate presentation of either subject. In sharp contrast are the sections on gross anatomy and physical examination, which are meager. A similar unevenness of distribution is obvious in the use of illustrations, which are in general good. The color cuts are well chosen but a bit florid. Consistently excellent throughout this work is the consideration of differential diagnosis. Specialist, clinician and student will profit by careful study of such sections. Revision and additions to the section on menstruation and endocrine influence call for favorable comment. The section on retroversion, particularly in relation to treatment, is sound and helpful. The section on the pathology of prolapse is excellent. A subject ordinarily difficult is here presented in lucid sequence. Conservative treatment is given almost more than its fair share of consideration. The rationale of operative care is well presented. Unfortunately, the procedure described for the control of prolapse does not seem to meet the broad indications laid down in the section on underlying pathology. Micropathology is skimped, purposely, no doubt. The discussion of acute salpingitis leaves the reader with the definite impression that the author favors early operation. An obvious effort is made to straddle the issue, yet the conviction remains that the author agrees with the "authorities who hold that the best treatment of salpingitis is to operate in the early stage of the attack, as in appendicitis." In the present status of our actual knowledge this wavering position seems totally indefensible. Out of charity one must suppose that this section has been overlooked in the revision of material for this edition. In spite of minor flaws, this must be regarded as an excellent textbook, of more value in academic teaching than in clinical practice; of considerably more value in fact in this teaching field than many of its superficially more brilliant contemporaries. In general a thoroughly sound and reliable work, it can be highly recommended for the teaching of basic gynecology to undergraduates.

Einfache quantitative, klinisch-chemische Harn- und Blutuntersuchungsmethoden: Eine Anleitung zur Ausführung diagnotisch wichtiger quantitativer Methoden ohne besondere Laboratoriumseinrichtung zum Gebrauch für die ärztliche Praxis. Von Prof. Dr. med. et phil. Erwin Becher, Oberarzt der Medizinischen Universitätsklinik, Frankfurt a. Main. Mit einem Vorwort von Prof. Dr. F. Volhard, Direktor der Medizinischen Universitätsklinik, Frankfurt a. M. Paper. Price, 7.50 marks. Pp. 165, with 7 illustrations. Jena: Gustav Fischer, 1934.

This is a compilation of the clinical and chemical methods for the investigation of diseases of the kidney, gallbladder and liver. For the most part the book deals with renal disease, and only a small but adequate section is devoted to the gallbladder and liver. The author has been closely associated with Volhard through practically all his work on renal disease and is well equipped both from experience and from training to present an authoritative treatise on this subject. While the work is essentially in manual form, the thoroughness with which the data are handled compares favorably with more exhaustive books on the subject. The reader further has the advantage of the author's extensive experience in not having to decide as to the value of any of the methods given. Only such procedures as have been definitely proved helpful clinically are discussed. An English edition of this book should be well received by the profession, as it is only by the application of such procedures that the subject of nephritis will become clarified. The manual should prove to be of great value to those who are interested in diseases of the kidney and liver and to those who would like to extend their information to the laboratory phases of the subject. The laboratory worker will also find this work an authoritative and explicit laboratory manual. The book is highly recommended to both.

Studies in Asphyxia: I. Neuropathology Resulting from Comparatively Rapid Carbon-Monoxide Asphyxia. II. Neuropathology Resulting from Comparatively Slow Carbon-Monoxide Asphyxia. III. Neuropathology Resulting from Comparatively Slow Carbon-Monoxide Asphyxia; Reaction During 16 to 165 Days After Exposure. IV. Neuropathology Resulting from Comparatively Rapid Asphyxia by Atmospheres Deficient in Oxygen. V. Blood Chemistry Changes Resulting from Comparatively Rapid Asphyxia by Atmospheres Deficient in Oxygen. VI. Blood Chemistry of Dogs After Comparatively Rapid Carbon-Monoxide Asphyxia. By W. P. Yant, John Chornyak, H. H. Schrenk, F. A. Patty and R. R. Sayers. Prepared by the Direction of the Surgeon General. U. S. Treasury Department, Public Health Service. Public Health Bulletin No. 211. Paper. Price, 15 cents. Pp. 61, with 86 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1934.

This bulletin of the Public Health Service presents in brief form a thorough study of the neuropathology resulting from (*a*) rapid, (*b*) slow and (*c*) long continued carbon monoxide asphyxia, (*d*) the comparable neuropathology of rapid asphyxia by atmospheres deficient in oxygen but containing no carbon monoxide, and the blood chemistry changes resulting from (*e*) rapid asphyxia by simple anoxia and (*f*) those induced by rapid carbon monoxide asphyxia. Photomicrographs of sections of the brains of asphyxiated dogs and rats are reproduced. Two types of degenerative changes were observed in nerve cells, some becoming shrunken and staining diffusely, others showing varying degrees of chromatolysis. In dogs these changes occurred chiefly in the cells of the cerebral cortex, in the corpus striatum and other basal ganglions. In rats the cortex was much less injured. In both species of animals, vascular changes were marked: dilatation of small blood vessels, stasis and perivascular hemorrhages. Edema occurred throughout the brains with infiltration of leukocytes, particularly in the meninges. The principal changes in the chemistry of the blood were decreased oxygen content, decrease both of the content of carbon dioxide and of the carbon dioxide capacity, and a lowering of p_H. The effects of asphyxia by simple oxygen deprivation and by 0.6 per cent carbon monoxide in otherwise normal air were essentially similar. None of the changes in the blood were such as would not be readily corrected when the anoxemia was relieved by treatment with oxygen or a mixture of from 5 to 7 per cent of carbon dioxide in oxygen. It is therefore apparent that the neuropathologic changes in the blood are not primarily responsible for the failure of moribund cases of carbon monoxide poisoning to respond to such treatment; the neuropathologic alterations initiated by profound and prolonged asphyxia are not reversible.

For the literature of the subject the reader is referred to a previous publication (Public Health Bulletin 195, 1930). Further observations on asphyxia are to be reported in a later publication, which would benefit from a closer correlation between the appearance and behavior of the subjects of the experiments and the structural and chemical changes than has been attempted in the present, otherwise excellent, article.

Étude sur le vibrion cholérique: Vibrio cholerae typus épidémicus et Vibrio cholerae typus endémicus. Par le Dr. W. Doorenbos, M.D., directeur du Laboratoire de Chatby du Conseil Sanitaire Maritime et Quarantenaire d'Egypte à Alexandrie. Paper. Pp. 120. Alexandria: Société de Publications Egyptiennes, 1934.

The epidemiology of cholera, as relating particularly to pilgrimages of the local region, is considered in the light of observations on the serologic and cultural characters of Vibrio cholerae, bacteriophage, bacterial variation and host factors. From carriers, the author isolated strains of vibrio having characters unlike typical epidemic strains but similar to variants obtained in the laboratory by bacteriophage action. He advances the proposition, therefore, that bacteriophage in the intestine induces the appearance of vibrios capable of maintaining the endemic type of cholera. This is the rôle of the chronic carrier, who should be controlled because avirulent strains may be converted under certain conditions to virulent epidemic forms.

Practical Obstetrics for Students and Practitioners. By P. Brooke Bland, M.D., Professor of Obstetrics, Jefferson Medical College, Philadelphia, and Thaddeus L. Montgomery, M.D., Associate in Obstetrics, Jefferson Medical College, Philadelphia. Second edition. Cloth. Price, $8. Pp. 730, with 516 illustrations. Philadelphia: F. A. Davis Company, 1934.

In this handy volume a great deal of practical obstetric knowledge is condensed. In this edition the work has been brought down to date, preventive obstetrics being particularly emphasized. The book presents mainly the principles and practice of obstetrics of the Jefferson Medical College of Philadelphia. Naturally there is much in it with which one will not agree, but the personality of the book needs no defense. After a clear cut description of the anatomy and physiology of the reproductive organs, the physiology, pathology and treatment of pregnancy are fully presented, then the physiology, pathology and treatment of labor, and then the complete story of the puerperium, followed by operative obstetrics. Would it not present to the student, for whom this book is mainly intended, a clearer conception of the whole subject if at first he was given a complete rounded picture of a normal pregnancy, labor and puerperium? Then the aberrations of pathologic pregnancies, labors and puerperia would be more readily recognized and absorbed in the mind. For example, the treatment of abruptio placentae is given before the student knows how a normal placenta is expelled, and the use of a bag in placenta praevia is shown before he is told how a cervix dilates during labor. The mechanism of labor is not as well described as its importance deserves. No mention is made of the work of Sellheim. The diagnosis and treatment of the pathologic presentations are good, the one adequate, the other conservative and practical. More value is attached to prenatal pelvic mensuration than recent experience would justify. Caldwell's and Molloy's classification of the pelvic forms deserves mention in the next edition; indeed, this may be said of several deficiencies and errors in giving credit for various procedures. A careful search through the literature for original sources is the only safeguard against such oversights. The puerperal hemorrhages are given brief and clear exposition, and the chapter on puerperal infections is concise and adequate. The therapeutic nihilism expressed is disappointing but concordant with fact, and the conservative attitude toward local intervention is commendable. A short chapter on anesthesia and one on repair of injuries precede the presentation of operative obstetrics. The classic cesarean section is given undue prominence in view of the fact that its mortality in Philadelphia is five times that of the low cervical operation. A chapter on obstetric jurisprudence closes the book. The references are grouped in an appendix under the title "Referred Reading." The illustrations, twenty-one in colors, are good. Many are diagrammatic and a considerable number are original. The publishers have not spared expense in producing a handy, good looking and readable volume.

Entomological Studies: Studies on Insects of Medical Importance in South Africa. By Botha De Meillon, D.Sc., F.R.E.S., from the Malaria Research Station of the South African Institute for Medical Research, at Tzaneen, Transvaal. Publications of the South African Institute for Medical Research, No. XXXIII (Vol. VI). Paper. Pp. 249-308, with 14 illustrations. Johannesburg: South African Institute for Medical Research, 1934.

This contribution to medical entomology consists of detailed and highly technical reports on the first part of a series of notes on South African Simuliidae, and descriptions of a new flea from the Transvaal belonging to the genus Xenopsylla, a new variety of Anopheles natalensis, the eggs of some South African anophelines, and the pupae of some heretofore undescribed South African anophelines.

The Human Body: Its Structure and Activities and the Conditions of Its Healthy Working. By H. Newell Martin. Twelfth edition revised by Ernest G. Martin, Professor of Physiology in Leland Stanford Junior University. Cloth. Price, $4. Pp. 701, with 167 illustrations. New York: Henry Holt & Company, 1934.

This has been a standard textbook in American colleges for fifty years and has been for many students the avenue of introduction to anatomy and physiology. The present edition, like the three preceding it, has been revised and edited by Ernest Gale Martin. The revision has dealt especially with subjects on which scientific growth has been rapid in recent years. The section on histology has been revised, the chapters on cerebral function and nervous conduction have been rewritten, the chapter on hormones is new. The work as revised maintains the standard set for earlier editions by Prof. H. Newell Martin. Since the publication, Dr. Ernest G. Martin has died. This edition constitutes a monument to these two great teachers of physiology.

Vegetable Drugs of India. By Devaprasad Sanyal, L.M.& S., Lecturer on Medical Jurisprudence, and Rasbehari Ghose, M.B., D.T.M.& H., Lecturer on Pathology and Bacteriology. Second edition. Cloth. Price, Rs. 4/8. Pp. 590. Calcutta: S. Chatterji, The Medical Publishers, 1934.

This book on the East Indian materia medica discusses the more modern views on the vegetable drugs alongside the uses the ancient Hindoo physicians made of them. The drugs are classified according to the system of the human body on which they chiefly exert their therapeutic action. One looks in vain for such drugs as digitalis, opium, cinchona or nux vomica, the book being avowedly devoted to the native drugs of India, among which one meets many to us well known with still more of them with which we are not familiar. One naturally wonders in view of this specialization to the vegetable drugs of India to what reading circle this book is addressed. If it is to be used as the principal book on materia medica in the teaching of medical students or if it is to serve as the guide in the selection of his remedy by the practicing physician, this exclusion of many of the most important remedies known to man is certainly objectionable. If this is the case, one must interpret this book as a manifestation of a nationalism so intense as to sacrifice the interests of the sick to the dictates of chauvinism; but this omission does not make the work any less interesting or useful as a reference work to the native drugs of India with which it deals.

Ergebnisse der experimentellen Krebsforschung und Krebstherapie. Von Dr. Ferdinand Blumenthal, Professor an der Universität Belgrad. Paper. Price, 4.25 H. florin. Pp. 183. Leiden: A. W. Sijthoff's Uitgeversmaatschappij N. V., 1934.

The author is the former director of the cancer institute of the University of Berlin, and for sixteen years he was the general secretary of a central committee (now dissolved) for the investigation and control of cancer in Germany. Being an active investigator, he is well qualified by training and experience to review the advances in our understanding of cancer and its treatment and control since the beginning of the experimental era in the investigation of cancer at the dawn of this century. The book is divided into twenty sections. There are no illustrations. At the end are 497 references, which are cited by numbers in the text. Unfortunately there is no subject index, but in its place is a detailed table of contents. Among the topics may be mentioned the definition and genesis of cancer, the relation of parasites, tar, the roentgen ray, irritation, trauma and heredity to cancer, precancerous conditions, the problems of the Rous sarcoma, and the principles of the treatment of cancer

by operation and by radiation. The final section is devoted to a review of organized efforts to control cancer through education of the public and of physicians and the setting up of fully equipped cancer centers. The book gives a concise but thorough and competent review of the progress of investigations of fundamental cancer problems, of the principles of modern treatment, and of the trends of the efforts to control cancer. It contains in condensed form a vast amount of information of value to the study of cancer.

The Principles of Therapeutics. By Francis Richard Fraser, M.A., M.D., F.R.C.P., Professor of Medicine in the University of London. The Abraham Flexner Lectures, Series Number 3. Published for Vanderbilt University. Cloth. Price, $2. Pp. 135. Baltimore: Williams & Wilkins Company, 1934.

It is difficult to write on the principles of therapeutics, and it may be impossible to write brilliantly on them or to avoid being platitudinous if one confines oneself to what is universally accepted. Dr. Fraser's book might serve as a gift to a medical student but it would not be of much profit to a mature physician.

Medicolegal

Pharmacy Practice Acts: Hydrogen Peroxide a "Drug or Medicine."—Arthur, a manager of a pharmacy, was charged with violating section 13 of the California pharmacy practice act in that he permitted named persons, who were not registered pharmacists or assistant pharmacists, to sell peroxide of hydrogen. He was found guilty in the trial court and appealed to the appellate department, superior court, Los Angeles County, California.

Section 13 of the pharmacy practice act makes it unlawful for any *"proprietor"* of a pharmacy to permit the sale of drugs, medicines or poisons by any one except a registered pharmacist or assistant pharmacist. The defendant contended that since he was not a *"proprietor"* but a *"manager,"* his conviction was unwarranted. The superior court held, however, that a mere statement in the charge that the facts alleged constituted a violation of one section of the pharmacy practice act did not prevent the court from upholding the conviction if the acts charged were prohibited by any other section. Section 12 of the pharmacy practice act, observed the court, declares it to be unlawful for *any person* to permit the sale of drugs and medicines "in his or her store or pharmacy," except by a registered pharmacist or registered assistant pharmacist. The words "his or her" do not necessarily denote ownership. They may signify simple possession. The purpose of the pharmacy act is to prevent the sale of drugs and medicines by any person not a registered pharmacist or assistant pharmacist. To carry out this purpose a penalty is imposed both on the unregistered person who sells and on the person in authority who permits him to do so. To limit the latter provision to proprietors only would tend to defeat this purpose, for many stores are owned by corporations which are not subject to the imprisonment provided as a part of the penalty. Furthermore, any proprietor residing out of the state, whether individual or corporate, would be entirely beyond the reach of the statute. Such a defeat of the purpose of the act may be avoided by giving to the words "his or her store or pharmacy" a meaning signifying any store or pharmacy over which the person charged has such control and authority as to enable him or her to prevent violations of the act by other persons.

The defendant next argued that peroxide of hydrogen is not a drug or medicine within the meaning of the pharmacy practice act. We are satisfied, said the court, that "drug or medicine" are broad enough to include peroxide of hydrogen. It is a well known chemical substance, listed in the United States Pharmacopeia and described in all encyclopedias. Its character and common uses are well within the scope of judicial notice. The defendant apparently cited *State* v. *Hanchette,* 88 Kan. 864, 129 P. 1184, where it was held that peroxide of hydrogen is not a medicine and hence its sale by unregistered persons was not prohibited by the Kansas pharmacy practice act. But, said the superior court, we are not disposed to follow this case in its apparent holding that the word "medicine" is limited to substances which are generally and popularly known as such, to the exclusion of those so regarded only by the medical profession. This is altogether too narrow a meaning for the word. There may be some difficulty in applying the pharmacy practice act to substances which have both a medical and a nonmedical use, but in the case of peroxide of hydrogen we are aided by the provisions of section 16 of the act, which provides, by way of exception to the general provisions of the act, that permits may be issued for the sale by unregistered persons in the rural districts of "simple household remedies and drugs," among which is listed peroxide of hydrogen. Such an exception gives rise to a strong implication that what is excepted would otherwise have been within the purview of the act.

For the reasons stated above, the judgment of conviction was affirmed.—*People v. Arthur (Calif.), 32 P. (2d) 1002.*

Liability of County for Emergency Medical Aid Rendered to a Poor Person.—A Nebraska statute imposes a duty on a county to furnish medical aid to certain classes of resident poor. Madison County, through its proper officials, appointed a physician to furnish such aid. The appointment of this physician did not seem to have been generally known among the medical profession in the county. A certain person, entitled to medical relief from the county, became ill from a diseased appendix. Her attending physician called the appropriate county commissioner, who authorized the patient's removal to a hospital but refused to authorize the surgeon's bill. The commissioner, however, did not ask that the patient be attended by the county physician or even refer to him. At the instance of the attending physician, the plaintiff-physician, Sayre, performed an appendectomy and the patient recovered. The case apparently was one of great emergency and a delay in operating might have been fatal. The county paid the hospital bill but refused to pay the operating physician. He brought suit and the trial court gave judgment for the county. Sayre died but the action was revived in the name of his executrix, his widow, and she appealed to the Supreme Court of Nebraska.

The question presented by this case, said the Supreme Court, is whether a physician, not employed by the county, may recover from the county for services rendered a poor person in an emergency, when the county has duly appointed a physician to care for the poor who was able, willing and ready to serve, but was not consulted. It was the duty of the county to furnish medical aid in this case, continued the court, but not necessarily to furnish the poor person's choice of medical aid. Statutes of the kind under consideration should be given a very liberal construction, and county officials should be generous in supplying the aid which the legislators intended for destitute persons. When, however, a county in Nebraska provides a physician to supply medical care to indigents, said the court, who is able and competent to give satisfactory service, and when that physician is ready and willing to render such service on call, then the duty of the county is fulfilled. Under such conditions, it is not permissible for the sick person to choose who shall render the service to him. The Supreme Court concluded, with one justice filing a dissenting opinion, that under the circumstances here involved the county was under no liability to pay for the services rendered by Sayre. If the county physician had refused or had been unable to attend or had been incompetent to take care of the case, a different question might have been presented, observed the court.

The judgment of the trial court in favor of the county was affirmed.—*Sayre v. Madison County (Neb.), 254 N. W. 874.*

Society Proceedings

COMING MEETINGS

American Orthopsychiatric Association, New York, Feb. 21-23. Miss Mary A. Clarke, 50 West 50th Street, New York, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Feb. 18-19. Dr. William D. Cutter, 535 North Dearborn Street, Chicago, Secretary.

Pacific Coast Surgical Association, Santa Barbara, Calif., Feb. 21-23. Dr. Edgar L. Gilcreest, 384 Post Street, San Francisco, Secretary.

Southeastern Surgical Congress, Jacksonville, Fla., March 11-13. Dr. Benjamin T. Beasley, 478 Peachtree Street, N.E., Atlanta, Ga., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

188: 745-884 (Dec.) 1934

*Chronic Congestive Splenomegaly and Its Relationship to Banti's Disease. R. C. Larrabee, Boston.—p. 745.

*Distinction Between Splenic Anemia and Subleukemic Splenic Reticulo-Endotheliosis. H. Z. Giffin and C. H. Watkins, Rochester, Minn.—p. 761.

Comparative Values of Several Antidotes in Cyanide Poisoning. K. K. Chen, C. L. Rose and G. H. A. Clowes, Indianapolis.—p. 767.

Inheritance of Diabetes Mellitus: III. Blood Sugar Values of Relatives of Diabetics. G. Pincus and Priscilla White, Boston.—p. 782.

Carbohydrate Metabolism in Human Hypothyroidism Induced by Total Thyroidectomy: I. Glucose Tolerance Curve and Fasting Serum Sugar Concentration. D. R. Gilligan, M. I. Abrams and Beatrice Stern, Boston.—p. 790.

Id.: II. Blood Sugar Response to Insulin. M. I. Abrams and D. R. Gilligan, Boston.—p 796.

Multiple Parathyroid Tumors with Massive Mediastinal and Subcutaneous Hemorrhage: Case Report. R. B. Capps, Boston.—p. 800.

Causes of Coma in Patients Entering a General Hospital. P. Solomon and C. D. Aring, Boston.—p. 805.

Spontaneous Hemophilia: Report of Six Cases in Brothers. R. Boggs, Boston.—p. 811.

*Familial Hemorrhagic Condition Simulating Hemophilia and Purpura Haemorrhagica. J. E. Farber, Buffalo.—p. 815.

Elongation of Red Blood Cells in Jewish Family. L. H. Pollock and W. Dameshek, Boston.—p. 822.

Experimental Interference with Conduction in the Heart. Jane Sands Robb, Mary Easby and J. G. F. Hiss, Syracuse, N. Y.—p. 835.

Clinical Significance of the M or W Shaped QRS Complex in Lead II of Electrocardiogram. J. Edeiken and C. C. Wolferth, Philadelphia.—p. 842.

Chronic Congestive Splenomegaly and Banti's Disease.—On the basis of a study of forty-seven cases, Larrabee expresses the view that in the majority of patients presenting the clinical picture of Banti's disease (splenomegaly with fibrosis, microcytic anemia with leukopenia and a late stage with hemorrhages and ascites) the condition is dependent on various intra-abdominal lesions obstructing the venous outflow of the spleen. By far the commonest of these is liver cirrhosis of various types. As Banti has limited the definition of the disease that bears his name in such a manner as to exclude these cases, it is thought best to segregate them under a distinctive name. However, splenectomy is indicated just as in Banti's disease, regardless of the nature of the underlying lesion. The physician or surgeon confronted with an actual case need not trouble himself with theoretical questions as to the nature of Banti's disease. If he has a patient showing the Banti preoperative picture, if he has watched the patient long enough and studied him carefully enough to exclude leukemia, hemolytic jaundice, polycythemia and certain other conditions, and if ordinary surgical considerations favor splenectomy, he need not hesitate to operate because he believes that the patient has alcoholic cirrhosis or some other equally definite cause of portal obstruction.

Distinction Between Splenic Anemia and Subleukemic Splenic Reticulo-Endotheliosis.—Giffin and Watkins report two cases originally diagnosed as splenic anemia and subsequently classified as subleukemic splenic reticulo-endotheliosis. The first of these was seen in an early stage of the disease; the second was more advanced at the time of the first examination. The clinical and morphologic features that should have suggested an earlier diagnosis of splenic reticulosis are as follows: history of preceding episodes of infection, a short history of the development of splenomegaly, slight purpuric manifestations with abnormalities of coagulation, leukopenia or normal leukocyte count with relative lymphocytosis and, in prolonged study of blood smears, the presence of reticulo-endothelial cells and the reticular type of monocyte. As the cases became more definitely leukemic, a higher percentage, between 20 and 30, of reticular cells could be found, even though leukocytosis was not present. The advanced stages in both cases were characterized by severe macrocytic anemia, which did not respond to treatment. The infectious hyperplastic type of reticulo-endotheliosis, in which reticular cells may be found in the blood smears, may be distinguished from leukemic reticulo-endotheliosis by the presence of an increased percentage of polymorphonuclears, the absence of immature reticular monocytes and clinical manifestations of a predominating infectious process. Cases of subleukemic monocytic myelosis reveal the presence of stem cells of the myeloid series and the absence of typical reticular cells. In splenic anemia, there is usually no definite history of episodes of infection, a history of fever is uncommon and splenomegaly usually has been present for years. Purpuric features are occasionally present in cases of splenic anemia, but apparently they are not nearly so common as with reticulo-endotheliosis. In splenic anemia the test of liver function almost always gives evidence of at least a moderate, and sometimes an extreme, grade of retention of dye, and gross gastro-intestinal hemorrhage is more common. Leukopenia with lymphocytosis is not uncommon in splenic anemia, but examination of blood smears, in addition to the absence of reticular cells, usually reveals more poikilocytosis and less macrocytosis. Prolonged study of blood smears is essential to the demonstration of the presence or absence of reticular cells, particularly in the early stages of splenic reticulosis.

Familial Hemorrhagic Condition Simulating Hemophilia and Hemorrhagic Purpura.—Farber presents a study of a family of 113 members during five generations, of which twenty-five members suffer atypical pathologic hemorrhage, fourteen of whom are males. The family tree in regard to the males has a striking similarity to that of hemophilia, but the affliction is essentially purpuric in nature. The males have been more markedly involved, four of their number having died directly from hemorrhage. The hemorrhagic incidents are variable but consist chiefly of prolonged frank bleeding from a cut or wound, ecchymoses and epistaxis in the males and menorrhagia and ecchymoses in the females. The coagulation time of the blood is normal, bleeding time is intermittently prolonged, platelets are numerically adequate, and the clot retracts normally. Blood chemistry is normal. There seems to be no definite relation of the bleeding to season, diet, infection or occupation. Telangiectasia and splenomegaly are uniformly absent. Hypertension "runs in the family"; brain hemorrhages are frequent.

American Review of Tuberculosis, New York

30: 599-778 (Dec.) 1934

*The Bronchiectatic Septic Tank: Its Prophylaxis and Treatment. C. Jackson and C. L. Jackson, Philadelphia.—p. 599.

Relations of Allergy and Immunity in a Clinical Case of Pulmonary Tuberculosis. H. Sewall and K. D. A. Allen, Denver.—p. 607.

Futurity Handicap of Tuberculosis Contact: Consideration of Data Relative to Preassessment and Prevention of Clinical Disease. A. H. W. Caulfeild and G. C. Anglin, Toronto.—p. 619.

*Carbon Dioxide Inhalation in Pulmonary Tuberculosis. A. L. Banyai, Wauwatosa, Wis.—p. 642.

*Artificial Pneumothorax in the 'Teens. B. L. Brock and A. B. Mullen, Waverly Hills, Ky.—p. 653.

Artificial Pneumothorax Technic. K. P. Jones, Olive View, Calif.—p. 670.

Oleothorax: Report of Cases. C. K. McCarthy, Rutland, Mass.—p. 677.

Pathogenicity of Mycobacterium Tuberculosis (Avium) for Dogs by Intracerebral Injection. P. E. Steiner, Chicago.—p. 683.

Cultivation of Tubercle Bacillus from Blood Stream by Loewenstein's Method. E. Maier, New York.—p. 695.

"The Bronchiectatic Septic Tank."—Bronchoscopic studies of the Jacksons indicate that the chief two primary causes of bronchiectasis are excessive viscosity of the primary pathologic bronchial secretions and the septic tank conditions they engender. The term "bronchiectatic septic tank" means not only a receptacle for septic material but a container in which the material is changed in physical character and bacterial content by bacterial processes, chiefly saprophytic, in a way parallel to the changes that the sanitary engineer uses to change the physical character and bacterial content of household sewage. The difference is that the concrete walls of the sewage septic tank are not acted on by the changed character of the contents,

whereas the living walls of the bronchi are damaged by the inflammatory changes set up by the irritating character of the by-products of the septic tank processes. Putrefaction will ultimately thin the viscid secretions, so that they can be expelled by coughing; but during the delay the septic tank processes have ruined the structural integrity of the walls. The chief means of preventing bronchiectasis is by forestalling the septic tank processes by bronchoscopic aspiration of the viscid pathologic bronchial secretions before they have time to rot. The primary pus in bronchiectasis is not coughed up; hence, when sputum is used, bacterial studies are misleading and autogenous vaccines are inefficient. The important organisms are found only in the residual pus removed bronchoscopically from primary foci after the bronchiectatic septic tank has been emptied by bronchoscopic aspiration.

Carbon Dioxide Inhalation in Tuberculosis.—Banyai found the administration of a mixture of 10 per cent carbon dioxide and 90 per cent oxygen by means of repeated inhalations to be a safe procedure in pulmonary tuberculosis. The most consistent benefits derived from this treatment were effortless expectoration, diminution of coughing and relief from dyspnea. Concomitant beneficial results were sustained rest for the diseased lungs during the absence of coughing, better and more relaxed sleep, improvement in the general well being, better appetite, and in some cases relief from laryngeal pain. The inhalation of carbon dioxide not only alleviates a distressing cough but also enables one to reduce the consumption of narcotics and expectorants in such cases. The treatment should be used only in selected cases, indicated in cases of strenuous, exhaustive coughing without effective expectoration: (1) if there is evidence of inflammatory exudation in the lungs, (2) when the cough is insufficient to evacuate sticky, thick sputum and thereby causes gagging, vomiting and incontinence, and (3) when sleep and rest of the patient are disturbed by coughing during the night. It is contraindicated in cases showing (1) hemorrhagic tendencies, because of a possible risk of inducing hemorrhage by increased respiratory expansion, (2) superficial, thin-walled cavities, because of the possibility of rupture and causing a pneumothorax, (3) marked emphysema, (4) widespread pulmonary fibrosis without atelectasis and without mucopurulent retention in the air passages, (5) acute plastic pleurisy and pleural effusion, (6) hypertension, (7) when the cause of dyspnea or coughing is outside the lungs, and (8) in extreme general debility.

Artificial Pneumothorax in Young Patients.—Brock and Mullen studied a group of 267 white tuberculous patients and 100 Negro patients between the ages of 12 and 21 years hospitalized in the sanatorium during the five-year period beginning September 1928 and ending September 1933. A comparison is made of results obtained in the three methods of treatment: artificial pneumothorax, phrenicectomy and routine sanatorium care. The study was also made to determine what effect the following factors might have on ultimate results in the different treatment groups: (1) sex, (2) age of patient, (3) amount of disease at the time of admission, (4) unilateral or bilateral disease at the time of admission and (5) positive or negative sputum following the period of hospitalization. The results show that young women in their teens obtain just as good results when hospitalized and properly treated as do young men of the same age. The results of treatment in this age group are just as favorable as those in older patients. The amount of disease with which a patient is admitted to the sanatorium plays a much greater part in determining end results than it is generally supposed and this is particularly modified according to whether the disease is unilateral or bilateral at the time of admission. When the sputum remains positive following hospitalization, the end results are uniformly poor. A negative sputum following hospitalization and treatment points to success of the treatment and favorable end results in the great majority of cases. In comparing the white and Negro races as to end results, the principal differences, regardless of the method of treatment employed, are the relatively low number of arrested cases and the high number of deaths in the Negro. Artificial pneumothorax therapy in this age group is far superior to other methods. If the diagnosis is made early enough and particularly before the disease becomes bilateral, the chances for favorable end results are good following immediate and successful collapse of the lung by means of artificial pneumothorax. The authors feel that this also holds true but to a lesser degree for the Negro. His disease is more frequently exudative with involvement of the lymph nodes in the hilus, and when this is present they feel that the chances for spread to the contralateral lung by way of the lymph canals, even in the face of a good collapse, is a possibility not to be overlooked.

Anatomical Record, Philadelphia

60: 377-516 (Nov. 25) 1934

Physiologic Marrow Ossification in Female Pigeons. P. Kyes and T. S. Potter, Chicago.—p. 377.
The Adrenotropic Substance of Hypophysis as Influenced by Age, Castration, Sex and Thyroparathyroidectomy. F. E. Emery and C. A. Winter, Buffalo.—p. 381.
Polyovular Follicles in the Cat. Pauline H. Dederer, New Haven, Conn.—p. 391.
The Response of Gonads of Immature Pigeons to Various Gonadotropic Hormones. H. M. Evans and Miriam E. Simpson, Berkeley, Calif.—p. 405.
Reduction of the Thymus by Gonadotropic Hormone. H. M. Evans and Miriam E. Simpson, Berkeley, Calif.—p. 423.
Motor Effects of Sensory Nerves Experimentally Connected with Muscles. P. Weiss, Chicago.—p. 437.
Studies on Cell Structure by the Freezing Drying Method: VI. Preparation and Properties of Mitochondria. R. R. Bensley and N. L. Hoerr, Chicago.—p. 449.
Effect of Theelin on Mammary Rudiments of Male Mice Differing in Susceptibility to Tumor Development. W. U. Gardner, A. W. Diddle, E. Allen and L. C. Strong, New Haven, Conn.—p. 457.
Intercalated Disks of the Heart Muscle of the Guinea-Pig: Counts of Number of Disks Present at Eight Ages of Normal Animals and in Two Experimental Groups. Elizabeth Selma Zschiesche and E. Frances Stilwell, Northampton, Mass.—p. 477.
The Transparent Chamber Adapted for Cell Culture and Permitting Access to the Contained Living Tissue. R. G. Williams, Philadelphia.—p. 487.
Adaptation of Transparent Chamber Technic to Skin of Body. R. G. Williams, Philadelphia.—p. 493.
Additional Evidence of the Failure of Epiphyseal Union in the Skeleton of the Rat: Studies on Wild and Captive Gray Norway Rats. A. B. Dawson, Boston.—p. 501.

Archives of Neurology and Psychiatry, Chicago

32: 1125-1374 (Dec.) 1934

Electrical Activity of Nervous System. E. D. Adrian, Cambridge, England.—p. 1125.
Relation of Conditioned Reflex to Psychoanalytic Technic. L. S. Kubie, New York.—p. 1137.
*Colloidal Thorium Dioxide: Its Use in Intracranial Diagnosis and Its Fate on Direct Injection into the Brain and Ventricles. L. Alexander, Boston; T. S. Jung and R. S. Lyman, Peiping, China.—p. 1143.
Experimental Poliomyelitis: Cytologic Studies of Cerebrospinal Fluid and Respiratory Metabolism of Excised Spinal Cord and Brain. M. Brodie and S. B. Wortis, New York.—p. 1159.
Psychogenic Motor Disturbances: Analysis of Their Etiology and Manner of Development. W. Malamud, Iowa City.—p. 1173.
*Myelotomy of the Commissure: New Method of Treatment for Pain in Upper Extremities. T. J. Putnam, Boston.—p. 1189.
*Graduated Jugular Compression in Lumbar Manometric Test for Spinal Subarachnoid Block. W. T. Grant and W. V. Cone, Montreal.—p. 1194.
Cerebral Circulation: XXXIII. Effect of Nerve Stimulation and Various Drugs on Vessels of the Dura Mater. J. L. Pool, Gladys I. Nason and H. S. Forbes, Boston.—p. 1202.
Spongioblastoma Polare of the Pons: Clinicopathologic Study of Eleven Cases. C. Pilcher, Nashville, Tenn.—p. 1210.
Intramedullary Tumors of the Brain Stem. C. C. Hare and A. Wolf, New York.—p. 1230.
Rubrospinal Tracts in the Monkey: Effects of Experimental Section. A. D. Keller and W. K. Hare, University, Ala.—p. 1253.

Colloidal Thorium Dioxide.—Alexander and his associates state that the injection of colloidal thorium dioxide into the carotid artery allows visualization of the cerebral arteries. It has been shown by Kwan that the procedure described by Moniz and modified by Löhr and Jacobi is feasible. From the literature suboccipital or lumbar injection of colloidal thorium dioxide appears to have important possibilities in encephalography. Its ultimate effect on the body has not yet been determined. Injection of colloidal thorium dioxide into the brains of dogs shows that it acts there as a foreign substance. No definite evidence of a special physicochemical destructive action on axis cylinders or on myelin sheaths could be demonstrated histologically in examinations covering a period of two months following the injection. The colloidal thorium dioxide is transported from the parenchyma of the brain to adjacent blood vessels at a rather quick rate and is thus carried away. Microscopic examination after injection into the brain shows that: 1. The extension of the lesion produced in the brain is largely dependent

on mechanical factors attending the injection. 2. Free granules of colloidal thorium dioxide are present in the brain only on the first day. The first granular cells that carry off the granules of colloidal thorium dioxide appear on the first day in the brain tissue; on the second day following the injection, the substance appears in the adventitia and endothelium of the adjacent blood vessels. 3. Leukocytic emigration is present on the first day and disappears on the second. Following injection into the ventricle the granules of colloidal thorium dioxide are taken off by proliferating ependymal cells, which become rounded, free, mobile granular cells (ependymogenous granular cells).

Myelotomy of the Commissure.—Putnam believes that in cases of intractable pain in the arm or shoulder the suggestion has doubtless been made that artificial destruction of the pain fibers as they cross in the decussation about the central canal would be a rational procedure. The author has carried out this procedure in three instances. The first patient was a woman with carcinomatous metastases in both axillae, with extreme pain. The cord was exposed from the fourth cervical to the third dorsal segment, and a needle was inserted between the posterior columns at intervals of a few millimeters up and down the exposed area and maneuvered in such a way as to pass through the commissure. It was found possible to carry this procedure to a segment or two beyond the limits of the laminectomy. The patient was not upset by the operation and was completely relieved from pain until death two months later. The second patient was a man with pain from carcinomatous metastases, apparently from the lung, which affected both sides of the neck as well as the axillae. The pain was so severe that doses of one-fourth grain (0.016 Gm.) of morphine did not wholly relieve it. A procedure similar to that used in the first case was carried out, except that a special instrument was used which appeared to give better results than the needle. In this case the section of the commissure was carried up to the first cervical segment. The patient was not completely relieved of pain in the upper cervical segments. The pain was, however, dull and burning instead of sharp, and codeine instead of morphine produced sufficient relief. In the third case the operation ended fatally, and it doubtless represents an error in judgment as well as an error in technic. The patient was a cachectic old woman, almost moribund from carcinomatous metastases to the shoulders and neck. She died following an operation in which the commissure was divided through the entire cervical region and the first two dorsal segments.

Graduated Jugular Compression in Lumbar Manometric Test for Spinal Subarachnoid Block.—Grant and Cone suggest that the graduated, measured jugular compression which can be obtained by applying a blood pressure cuff with its attached sphygmomanometer to the neck provides a method for determining spinal subarachnoid block that has many advantages. It gives a measured, graduated jugular compression, which can be duplicated exactly in the same patient. It makes possible a standard that can be used from patient to patient. The results obtained by different operators are in much closer agreement and are therefore more dependable.

Minnesota Medicine, St. Paul

17: 683-748 (Dec.) 1934

*Treatment of Carcinoma of Breast: Combined Surgical and Irradiation Treatment. A. Schwyzer, St. Paul.—p. 683.
Ovarian Tumors Arising from Embryonic Rests. Selma C. Mueller, Duluth.—p. 692.
Federal Emergency Relief. J. G. Crownhart, Madison, Wis.—p. 695.
*Choice of Anesthetic Agents and Methods and Suggestion to Facilitate Blood Transfusion. J. S. Lundy, Rochester.—p. 699.
Injection or Nonoperative Treatment of Hernia. L. M. Larson, Minneapolis.—p. 703.
Transfusion: Comparison of Results Obtained by Blood Grouping and Direct Matching. B. T. Horton and C. H. Watkins, Rochester.—p. 711.
Contagiousness of Types I and II Pneumococcus Pneumonia. H. A. Reimann, Minneapolis.—p. 714.

Surgical and Radiation Treatment of Carcinoma of Breast.—Schwyzer believes that surgery, even in well localized mammary carcinoma, should be radical, obeying Halsted's teaching. Only exceptionally and for serious reasons may one deviate somewhat from this principle. The radio knife is of great advantage in sealing the wound, rendering it less ready for implantation. The danger of implanting liberated carcinoma cells during the operation is to be kept in mind constantly. In far advanced conditions the excision of foul smelling ulcers by cautery or otherwise, followed or not by Thiersch transplantation, may become desirable. When unbearable pain persists in recurrence after operation and the arm is greatly swollen and useless, the author has seen great relief in one case from an interscapular exarticulation of the arm, as advised by Carl Beck. Preoperative irradiation confined to three days appears of great benefit. As this involves no loss of valuable time, it should be more readily consented to by many surgeons who would object to a delay of eight weeks, as some modern radiologists demand for preoperative treatment. Such loss of time and the mental strain on the patient with the operation constantly before him is not to be underrated. When radium is used, 50 mg. or more over a wooden block 3 cm. thick is applied to different fields, to the amount of from 1,200 to 2,000 mg. hours as the case may require. This, with a day or two of rest before the operation, does not disturb the patient. Postoperative irradiation, moderate in dosage but continued over a long period, in many cases if possible even over a very long period, seems to be of greatest value. The dose of a single postoperative treatment should range between 60 and 80 roentgens after from two to four stronger initial doses of about 130 roentgens. The first three doses are usually given at intervals of one week, then the next two or three doses at intervals of two weeks. After this the patients receive one treatment a month for two years, then for the next two years, if there is no particular reason to give more, one every second month, and if the patients live and one can make them see the value of perseverance, they get three or four treatments during the fifth and sixth years. After this, in cases in which a poor prognosis was made originally, the author likes to give a treatment twice a year for several years more. Castration, as advised by some earlier authors, has apparently no marked effect on the course of the disease. Though he operates in practically every case that is not too unreasonably far advanced, he feels that irradiation will gradually come more into its rights and is at present a most important help to surgery, preoperatively and postoperatively.

Blood Transfusion.—Lundy prefers the indirect method of blood transfusion. To the already established method he adds sodium citrate as an anticoagulant and administers the blood to the recipient slowly in order to avoid chills and other untoward results. The rate of administration is about 15 cc. per minute. He calls attention to two measures that in his experience have facilitated blood transfusion. The first is the grading of the donor's veins as poor, fair, good or excellent, so that in an emergency one may call for a donor with good or excellent veins. The second is that, in any case in which it is expected that blood transfusion or intravenous infusion may be necessary any time in the near future, the skin overlying the good veins in the ankles, arms and backs of the hands of the recipient is marked with a dye so that if the intravascular pressure becomes markedly reduced, and ordinarily the veins would be difficult to find, one may insert the needle through the mark on the skin and more easily accomplish whatever intravenous injection is necessary.

Northwest Medicine, Seattle

33: 379-422 (Nov.) 1934

Surgical Procedures Involving Common Bile Duct in Biliary Tract Disease. V. C. Hunt, Los Angeles.—p. 379.
Claims of Pathologic Anatomy. H. E. Robertson, Rochester, Minn.—p. 383.
Sacro-Iliac Conditions. T. E. P. Gocher, San Francisco.—p. 387.
Cancer of Rectum: Critique of Operations in Vogue. M. S. Woolf, San Francisco.—p. 391.
Fibromyxoma of Left Auricle. C. R. Jensen, Seattle.—p. 394.

33: 423-460 (Dec.) 1934

Acute Pulmonary Edema. G. W. Millett, Portland, Ore.—p. 423.
*Use of Stock Vaccines in Chronic Arthritis. K. K. Sherwood, Kirkland, Wash.—p. 426.
Roentgen Therapy in Menorrhagia. F. J. Moffatt, Medford, Ore.—p. 430.
Rotating Extension Splint in Fractures of Lower Leg. J. E. Bittner Jr., Yakima, Wash.—p. 433.
Calcium or Sugar Imbalance. L. D. Inskeep, Medford, Ore.—p. 435.

Use of Stock Vaccines in Chronic Arthritis.—Sherwood analyzes 674 cases of arthritis treated with stock vaccine, of which 68 per cent were found to be improved markedly or

free from symptoms and an additional 22 per cent showed some improvement. The location of the arthritis, the age and sex of the patient, the severity of the symptoms and the type of disease do not influence the results statistically. Cases having symptoms less than three months respond more favorably than those of longer duration. After a duration of three months, the length of time the symptoms have been present does not greatly influence the results. The presence of complications distinctly lessens the chances for satisfactory results. Four vaccines have been used, the best results being obtained with a dilute modified respiratory vaccine.

Ohio State Medical Journal, Columbus

30: 705-792 (Nov. 1) 1934

Scientific Medicine in the Changing Social Order. C. L. Cummer, Cleveland.—p. 725.
Basic Principles in Medical Service. J. A. Caldwell, Cincinnati.—p. 731.
Torsion of Great Omentum Associated with Subacute Appendicitis. R. B. Poling, Youngstown.—p. 735.
Probable Traumatic Thrombophlebitis of Axillary and Brachial Veins: Case. M. H. Grossberg and S. O. Freedlander, Cleveland.—p. 736.

30: 793-856 (Dec. 1) 1934

Acute Empyema: Comparison of Results in Children and Adults. C. R. Steinke, Akron.—p. 813.
Care of Umbilical Cord in the New-Born. R. O. Brigham, Toledo.—p. 815.
Tuberculosis Among Rural Children in Lorain County. H. R. O'Brien, Oberlin.—p. 816.
Arthritis. T. E. Newell, Dayton.—p. 820.
Abdominal Pregnancy: Report of Case Two Weeks Past Term. W. Bronaugh, Belpre.—p. 823.

South Carolina Medical Assn. Journal, Greenville

30: 217-234 (Nov.) 1934

Immunization Against Diphtheria. Hilla Sheriff, Spartanburg.—p. 219.
Use and Abuse of Drugs in Treatment of Children. J. P. Price, Florence.—p. 221.
Typhoid Fever, Alkaline Treatment. W. T. Lander, Williamston.—p. 225.

Wisconsin Medical Journal, Madison

33: 869-984 (Dec.) 1934

*Age of Onset of Pulmonary Tuberculosis. J. E. Habbe, Milwaukee.—p. 879.
Direct Signs of Duodenal Ulcers. M. E. Gabor, Milwaukee.—p. 882.
The Moloch of the Tropics. M. Fernan-Nunez, Milwaukee.—p. 889.
Congenital Esophageal Atresia. J. Docter, Racine.—p. 892.
Palliative Treatment of Inoperable Carcinoma of the Stomach by Means of Jejunostomy. C. O. Diamond and E. H. Mensing, Milwaukee.—p. 893.
Perinephric Abscess with Reno-Inguinal Fistula: Report of Case. J. A. Schindler, Monroe.—p. 895.

Age of Onset of Pulmonary Tuberculosis.—During a period of eight years, Habbe examined about 5,000 adults, the males predominating over the females in the proportion of about four to one. The average age of the entire group was 35 years. There were sixty-four cases diagnosed as active pulmonary tuberculosis, of which there were seventeen cases of minimal involvement, twenty-six cases of moderately advanced disease and twenty-one cases of far advanced disease. Two of the entire series of patients (both men) had roentgenologically normal lungs at the age of 29 and 30 years, respectively, and became roentgenologically and clinically positive at the age of 32 and 31. The man whose lungs were negative at the age of 30 and positive (far advanced) at 31 in all probability contracted the disease from his active wife or child. From the best evidence available, the man who at the age of 29 was roentgen negative and moderately advanced at 32 was living in a family in which there was no active tuberculosis. So far as the author has studied the material, he has obtained no evidence to disprove the opinion of Brown and Sampson as to the relative rarity of chronic pulmonary tuberculosis developing in persons who have roentgenologically normal lungs at the age of 25 years or older. He states that the fact of regular pathologic onset of chronic pulmonary tuberculosis in early adult life, once proved, would be an important one for clinicians and roentgenologists alike. It would serve to intensify the search among young adults for clinically latent lesions, it would aid in a more prompt differential roentgen diagnosis in many cases when previously taken normal roentgenograms were available for comparison, and in complicated lesions, such as mixed silicosis and tuberculosis, it would give a better understanding of the time of onset and development of the several lesions.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

57: 211-354 (Oct.) 1934

Observations on Referred Pain. C. Bolton.—p. 211.
Tuberous Sclerosis with Epilepsy (Epiloia) in Identical Twins. H. Fabing.—p. 227.
Study of Muscle Chemistry in Myasthenia Gravis, Pseudohypertrophic Muscular Dystrophy and Myotonia. S. Nevin.—p. 239.
The Venous System of Velum Interpositum of the Rhesus Monkey and Effect of Experimental Occlusion of the Great Vein of Galen. T. H. B. Bedford.—p. 255.
Autonomic Control of the Urinary Bladder. O. R. Langworthy, D. L. Reeves and E. S. Tauber.—p. 266.
*Generalized and Vertebral Forms of Myeloma: Their Cerebral and Spinal Complications. P. G. Denker and S. Brock.—p. 291.
Effects of Experimental Lesions of Posterior Columns in Macacus Rhesus Monkeys. A. Ferraro and S. E. Barrera.—p. 307.
*Inorganic Constituents of Cerebrospinal Fluid Versus Ventricular and Loculated Fluid. R. A. McCance and Elsie Watchorn.—p. 333.
*Relationship Between Sugar and Urea Contents of Blood and Cerebrospinal Fluid. J. N. Cumings and E. A. Carmichael.—p. 338.

Generalized and Vertebral Forms of Myeloma.—Denker and Brock present four instances of myeloma with neurologic complications. The first is an example of the generalized form of the disease. The other three illustrate the vertebral type in which the myeloma is circumscribed to vertebral and extradural tissues at the time of the rapid development of signs of spinal cord compression. The upper thoracic cord is usually the part involved. The patient is generally in the fifth or sixth decade of life. Roentgenograms may show destruction of the diseased vertebra. Laminectomy reveals a reddish gray extradural growth, removal of which is followed by great, if temporary, improvement. High voltage roentgen therapy and the wearing of a back brace are advised after laminectomy. Myeloma may be regarded as a malignant tumor of the bone marrow arising either from a single cell type, the plasma cell or perhaps from a number of different bone marrow elements. Depending on the type of cell, plasmocytomas, erythroblastomas, myelocytomas and lymphocytomas have been differentiated in the myeloma group (Ewing). There is still a great deal of difference of opinion concerning the pathogenesis of these growths. Most pathologists regard either the plasma cells or the myeloblasts of the bone marrow as the original cells of the growth. The disease is rare. The flat, short bones: the rib, sternum, scapula, skull and vertebra, are especially involved. Soft gray or reddish gray masses start in the marrow, grow outward and replace the cortex of the bones. Secondary growths may appear in the liver, spleen, kidney, lung and sex glands. Myeloma occurs in the later period of life. Pathologic fracture of a rib or vertebra is a frequent late occurrence; in no other type of bone tumor does pathologic fracture occur so frequently (62 per cent of all cases). No definitely curative form of treatment for generalized myeloma is known. Craver and MacComb report favorable results in five of a series of six cases by the use of Heublein's method of total body roentgen irradiation. The prognosis is grave. The average duration of life is two years, the longest duration of any proved case being five and one-half years. Once the tumor has appeared in many bones, the diagnosis is easily made. The age group (fifth and sixth decades), multiple involvement of the short flat bones of the trunk, pathologic fracture of a rib, Bence-Jones bodies in the urine, progressive anemia, nephrosis and cachexia make a highly characteristic clinical picture.

Inorganic Constituents of Cerebrospinal Fluid Versus Ventricular and Loculated Fluid.—McCance and Watchorn state that ultrafiltration will not explain the amounts of potassium and magnesium found in ventricular fluids. Such fluids in fact appear to contain slightly more magnesium and less potassium than lumbar fluid. As regards these two ions, therefore, ventricular fluid is even less like a serum ultrafiltrate or a pathologic transudate than is the spinal fluid. Judged by their magnesium and potassium contents, loculated fluids taken from below spinal tumors resemble ventricular fluids or spinal fluids and not serum ultrafiltrates. Such loculated fluids appear to contain more calcium than fluids from the ven-

tricles, normal cerebrospinal fluid or serum ultrafiltrates, and this may be connected with their large protein contents.

Relation Between Sugar and Urea Contents of Blood and Cerebrospinal Fluid.—In an attempt to determine the relationship between the sugar and urea contents of the blood and cerebrospinal fluid, Cumings and Carmichael observed that the levels of sugar and urea in the lumbar fluid do not rise in association with a normal rise in the contents of these substances in the blood. Estimations of ventricular fluid sugar demonstrate that only in abnormal conditions is there any rise in the fluid sugar in association with a rise in the blood sugar. The observations are in favor of the choroid plexus taking an active part in the control of the level of sugar and urea in the cerebrospinal fluid.

Journal of State Medicine, London

42: 559-620 (Oct.) 1934

Value of Culture in Solution of Problems of Tuberculosis. Evelyn M. Holmes.—p. 559.
Huntington's Chorea and East Anglia. M. Critchley.—p. 575.
Herrings as Food. K. Maclennan.—p. 588.
Aims of Torry Research Station and Brief Account of Its Work. A. Lumley.—p. 599.
Place of Refrigeration in Preservation of Herring as Food. G. A. Reay.—p. 602.
Vitamins from Marine Sources. J. A. Lovern.—p. 607.
Factors Affecting Hygienic Quality of Milk on Delivery to Consumer. A. T. R. Mattick.—p. 614.

42: 621-682 (Nov.) 1934

The Difficult Child. G. A. Auden.—p. 621.
Prevention of Constipation in Children. Hazel H. Chodak Gregory.—p. 632.
Diet of School Children. G. E. Friend.—p. 639.
Abnormal Childbirth in Rural Home. M. W. Bulman.—p. 648.
Recruiting, Training and Postcertificate Supervision of the Rural Midwife. G. B. Carter.—p. 656.
Destruction of Living Cells (Protozoa) by Invisible Ultraviolet Rays Below Four Thousand Angstrom Units (All-Quartz Optical System Employed). S. M. Copeman.—p. 665.
Public Gardens and Open Spaces and Their Influence on Public Health. B. Holmes.—p. 669.

Lancet, London

2: 1089-1144 (Nov. 17) 1934

Flat Feet. P. Wiles.—p. 1089.
*Some Observations on Hypochromic Anemia and Its Relation to Pregnancy. D. T. Davies and Ursula Shelley.—p. 1094.
Crural Monoplegia of Cortical Origin. W. R. Russell.—p. 1099.
Sclerosing Solutions for Varicose Veins. J. W. Riddoch.—p. 1101.

Hypochromic Anemia and Pregnancy.—Davies and Shelley give an account of observations conducted on fifty-one apparently normal women who were followed carefully through their pregnancy and of twenty who were frankly anemic after their last confinement. The anemia was hypochromic in character and the response to iron therapy good. Of the fifty-one patients who were followed through their pregnancy and puerperium, six developed some degree of anemia. All were apparently healthy when they were first seen, and the majority were young women bearing their first child. Of the forty-five women who passed through pregnancy without exhibiting any anemia, a normal gastric secretion was found in all. As Castle and Strauss showed, there is quite a definite although temporary reduction in acidity, especially in the third trimester, but this is replaced by a return to normal in the puerperium. While the patients demonstrated this change, none showed any permanent reduction. The reduction in acidity might be enough to result in a temporary state of achlorhydria, as in two of the cases, but this appears to be uncommon. The patients examined and found to be anemic showed a high incidence of anacidity. This abnormality was present in twenty-three of the twenty-six anemic patients—achlorhydria in fifteen and hypochlorhydria in eight. The analyses from which these figures are calculated were done some months after pregnancy in twenty and in the puerperium in six, when the gastric juice would be normally at its highest. Achlorhydria or hypochlorhydria in these cases must therefore indicate a permanent change in the gastric secretion. The authors believe that the anemia in these patients is due mainly to the long standing gastric deficiency. The gastric anacidity results in a poor absorption of iron and, when pregnancy calls for an extra amount of available iron, the mother's hemoglobin manufacture fails and anemia develops. Second in importance to the gastric secretion is the diet. While the need of the pregnant woman for an abundance of essential substances is fully recognized, it is possible that the increasing importance given to the treatment of the toxemias of pregnancy and their early recognition has resulted in too great a readiness to advise restrictions in diet. The liberal use of iron will prevent the development of this anemia. It would not be impossible to forestall its appearance. A course of iron during pregnancy would ensure a good supply for the fetus without depleting the maternal stores. The testing of gastric function in pregnancy when anemia is present is of more than academic interest, and the presence of a permanent achlorhydria would be a sufficient explanation for the anemia, as well as being an assurance of the benefit of iron therapy.

Paris Médical

2: 321-332 (Oct. 27) 1934

Lung Abscess in Severe Diabetes: Recovery. G. Etienne and P. Louyot.—p. 321.
Aseptic Puriform Meningitis in Infancy. R. Turquety.—p. 325.
*Blood Manganese in Some Nervous Disorders. C.-I. Urechia, G. Pamfil and Mme. Retezeanu.—p. 330.

Blood Manganese in Nervous Disorders.—Urechia and his collaborators used the colorimetric method in measuring the amount of manganese in the blood. It consists in the transformation of the manganese compound into the manganate ion. The total blood, erythrocytes or serums are weighed accurately, and 10 cc. of nitric acid and 5 cc. of hydrogen dioxide are added to destroy the organic substances. The mixture is evaporated in a water bath in a Jena glass to from 60 to 100 cc. during two or three hours. The reaction is ready when the mixture becomes perfectly clear and shows a yellowish coloration. The clear liquid thus obtained is evaporated to dryness in a porcelain crucible. The residue is heated over a low flame and finally over a stronger flame to destroy the organic substances and carbon. The dry residue is then mixed in a porcelain crucible with 0.5 Gm. of potassium nitrate or potassium chlorate and 100 Gm. of anhydride sodium carbonate. This is heated to complete fusion, so that a homogeneous mass is obtained. The oxidizing mixture transforms the manganese compound into manganate ion, which takes a green color. Similar steps are taken with titrated solutions of manganese salts containing 0.0001, 0.000005 and 0.000001 Gm. of manganese per cubic centimeter. The color of the final products should be compared with the unknown for titration. In this manner the authors measured the blood serum manganese of thirty-nine patients affected by different nervous disorders. The values obtained varied between 0.00001 and 0.00003 per cent. Similar comparative tests were made on the erythrocytes of fourteen of these patients, in whom in general lower values were obtained. In general, therefore, there is a smaller quantity of manganese in the cells than in the serum and it seems advisable to examine the serum or the whole blood. Their results did not allow conclusions to be drawn regarding the different nervous disorders.

Schweizerische medizinische Wochenschrift, Basel

64: 1081-1100 (Dec. 1) 1934

Pathology and Therapy of Gastric Ulcer. A. Schüpbach.—p. 1081.
*Newer Investigations on Pathogenesis of Thrombosis. A. Fonio and A. Vannotti.—p. 1086.
*Immunization by Inhalation. W. Silberschmidt.—p. 1089.
Synthesis of Paired Mentholglycuronic Acid in Various Disturbances of Liver. B. A. Nasarijanz.—p. 1090.
Congenital Torticollis. C. Martin-du Pan.—p. 1091.

Pathogenesis of Thrombosis.—Fonio and Vannotti believe that an impairment of the venous endothelium is the primary factor in the pathogenesis of thrombosis. Such an impairment may be produced by endogenous and exogenous factors. The first group includes all factors that cause a disturbance in the metabolism between blood and endothelium, particularly changes in the blood such as postoperative increase in the viscosity of the blood, acceleration of the sedimentation speed of the erythrocytes, changes in the protein colloids of the blood, disturbances in the acid-base equilibrium, hypinosis and increased instability of the plasma. Toxins and infectious processes likewise may cause impairment of portions of the endothelium. The exogenous factors are those which, damaging the vascular wall, finally impair also the endothelium. In this connection the authors mention infectious processes of the vascular wall or its sur-

roundings, which finally penetrate to the intima and produce an impairment of the endothelium (phlebitic processes caused by infection, syphilis, tuberculosis and so on), also traumas, burns, freezing and electrical influences. They describe experiments in which they induced exogenous impairment of the endothelium by electrical coagulation with a microcautery. Following this they studied the vessel under the capillaroscope and observed the gradual formation of a thrombus. They show diagrams of the process. Compression of the vessel leading to retardation of the blood stream was found to accelerate thrombus formation, but this was the case only in the presence of endothelial impairment.

Immunization by Inhalation.—Silberschmidt has shown that the repeated inhalation of diphtheria toxoid or of tetanus toxoid produces temporary immunity in susceptible animals. He describes experiments concerning anaphylaxis following inhalation. He found that guinea-pigs which had inhaled serum developed typical anaphylactic manifestations following the intravenous injection of the same serum. In another series of experiments the action of inhaled toxins was studied. It was found that guinea-pigs die quickly following the inhalation of pure diphtheria toxin, while diluted toxin causes death less rapidly. Mice and rats tolerated the toxin. Inhalation of tetanus toxin proved fatal to the three types of animals, but mice and rats survived longest. Inhalation of toxin proved harmless in animals that had received a prophylactic injection of the specific antitoxin. The author studied what effect the inhalation of a 2 per cent solution of antimony and potassium tartrate would have on rats and mice that had been infected with pathogenic trypanosomes. The animals reacted differently. In some the inhalation caused the complete disappearance of the trypanosomes, while in others the parasites caused death. Some animals that became free from parasites died with the signs of antimony poisoning. Nevertheless, the experiments demonstrate that trypanosomiasis may be therapeutically influenced by way of the respiratory tract.

Archivo Italiano di Chirurgia, Bologna

38: 367-526 (Nov.) 1934. Partial Index

*Pathologic Significance and Experimental Production of Dynamic Hydronephrosis. E. Ragnotti.—p. 367.
Experimental Lesions of Tendons and Their Correction by Tenotomy. V. Bossi.—p. 433.
Ether Anesthesia During Serum Treatment in Experimental Tetanus. G. M. Giuliani.—p. 479.

Experimental Production of Dynamic Hydronephrosis.—Ragnotti performed the denervation of the ureters in dogs, by chemical and mechanical means, for the purpose of investigating whether the so-called dynamic hydronephrosis may be originated in the denervation of the ureters by itself or whether anatomic alterations of the structure also play a part and, if this is the case, to what extent they are responsible in producing the condition. The author determined the relationship of the structural changes of the ureter after denervation and its functions (studied in vitro by a method used to stimulate peristaltic activity) on the one hand, and the alteration of the kidney on the other. He concludes that chemical denervation, sympathectomy provoked by the application of isophenol (a cresol-phenol derivative) to the internal coats of the ureter, causes transient alterations of the peristaltic movements of the ureter without interfering with the pendular movements of the ureter, as well as ureteral and renal structural lesions which follow a regressive evolution as the nervous system of the ureter regenerates and do not end in the production of a hydronephrotic ureter. The mechanical denervation produced by decortication of the ureter results in the formation of connective tissue in the internal ureteral coats, which interferes with the motor functions of the ureter and with the elasticity and distensibility of the ureteral walls. The condition progresses to the development of more or less grave hydronephrotic functional disturbances and anatomic alterations, both of which become more serious as the ureteral lesions grow worse, and a vicious circle becomes established. Disturbances of the ureteral innervation cannot by themselves produce hydronephrosis. Therefore the pathogenesis of experimental dynamic hydronephrosis is mechanicodynamic.

Archiv für klinische Chirurgie, Berlin

181: 193-382 (Nov. 12) 1934. Partial Index

Organization of Blood Donors in Soviet Union. E. Burceva.—p. 193.
*Experimental Studies of Hemolytic Shock in Blood Transfusion: I. Pathogenesis of Cardiac and Vascular Alterations. J. Petroff, A. Filatov, L. Bogomolova and X. Stroikova.—p. 209.
*Id.: II. Rôle of Central Nervous System in Pathogenesis of Vascular Disturbances in Hemolytic Shock. P. Wesselkin, J. Lindenbaum and N. Kartaševskij.—p. 227.
*Id.: III. Experimental Observation on Renal Activity on Introduction of Heterogenous and Autohemolyzed Blood. W. Iljin.—p. 240.
Id.: IV. Potassium and Calcium Blood Content in Hemolytic Shock. A. Mincev.—p. 250.

Cardiac and Vascular Alterations in Blood Transfusion.—From experimental studies, Petroff and his co-workers conclude that intravenous introduction in animals of the animal's own hemolyzed blood or of heterogenous blood produces alterations which are analogous to a hemolytic shock with a predominance of alterations on the part of the heart and the vascular system. The pathogenesis of these alterations is not explained. The authors have undertaken experiments to elucidate the problem. They have demonstrated by registering the heart volume and determining the arterial and the venous blood pressures that the fall in cardiac activity in hemolytic shock is a secondary phenomenon resulting from a diminished venous return to the heart. Experiments with determinations of blood pressure in the pulmonary arteries and veins have demonstrated likewise that cardiac failure in hemolytic shock is a secondary phenomenon and that the lumen of finer vessels of the pulmonary circulation becomes narrowed. These alterations do not play an important part in the hemodynamic disturbances. Experiments with volume determinations of kidneys, spleen, hind legs and brain indicate that the introduction of hemolyzed or foreign blood causes a marked narrowing in the lumen of the renal and splenic blood vessels. The circulation in the brain and in the hind legs was only slightly affected. In a fourth series of experiments, circulatory disturbances were studied in the vessels of the intestine and of the hind legs as well as the alterations in the capillary system in the presence of an intact nervous system. These experiments demonstrated that the main alterations in the circulatory system in hemolytic shock proceed from the alterations in the walls of the arteries and the veins. These changes consist of dilatation and even of paralysis of the capillaries and narrowing of the lumen of the arteries and the veins of the systemic circulation. The alterations in the functional activity of the heart and circulation are secondary to the alterations in the peripheral circulation. The disturbances were more marked when hemolyzed erythrocytes were introduced than after the introduction of blood plasma.

Pathogenesis of Vascular Changes in Hemolytic Shock.—Wesselkin and his co-workers state that typical hemolytic shock may be induced in the dog by transfusing it with its own hemolyzed blood, with whole blood or with hemolyzed human erythrocytes. The symptoms are particularly acute when human erythrocytes are used. The authors have been able to substantiate the basic experiments of Hesse and Filatov as to the spasm of the renal arteries constituting a characteristic symptom of the acute stage of shock. The diminution of the volume of the kidney develops at the same time independently of the fall in blood pressure but becomes more pronounced with a simultaneous fall in the latter. The duration of the renal spasm varied in their experiments from twenty seconds to thirty minutes. Repeated transfusions of the dog's own hemolyzed blood, of heterogenous whole blood or of erythrocytes had a tendency to diminish the severity of shock or to abolish it altogether. The kidney responded no longer with a spasm but, to the contrary, with dilatation. Decerebration, sectioning of the spinal cord immediately below the medulla oblongata, sectioning of the two splanchnic nerves below the diaphragm, removal of the celiac ganglion and of the two sympathetic trunks in the abdominal cavity, as well as total denervation of the kidneys failed to prevent the renal spasm in hemolytic shock. The partly denervated kidney reacted weakly with a spasm to hemolytic shock. When the renal vessels were directly transfused with hemolyzed blood, a rapid and pronounced contraction took place in them with a diminution of the renal volume as demonstrated by an oncograph. The authors conclude that the renal spasm in hemolytic shock

is of peripheral origin and that the nervous system plays an unimportant secondary part in its development. The acute picture of hemolytic shock resembles closely that of histamine shock. It is possible that histamine-like substances play an important part in the pathogenesis of the acute hemolytic shock.

Renal Activity on Introduction of Autohemolyzed Blood.—Iljin experimented with transfusions of human blood in dogs. The fatal single dose varied in amount between 15 and 20 cc. of blood per kilogram of the animal's weight. The introduction of the same amount and of larger amounts of dog's own hemolyzed blood failed to kill the animal. A single transfusion with human blood resulted in a marked diminution of the urinary output and a rise of the residual nitrogen in the blood, which reached its peak in from twenty-four to forty-eight hours. The rise in nitrogen content of the blood is caused by the disturbance of the renal function, but the latter is not the only factor in accumulation of nitrogenous products of albuminous decomposition in the blood. Repeated transfusions of human blood in amounts of 7 cc. per kilogram weight of the animal caused a greater rise of residual nitrogen than a single larger dose. Renal activity in that instance was less disturbed. Disturbance of the renal activity cannot alone be held responsible for the vascular phenomena of shock following the introduction of heterogenous blood. The introduction of the dog's own hemolyzed blood results in milder disturbance of renal activity than the introduction of heterogenous blood.

Deutsche medizinische Wochenschrift, Leipzig

60: 1823-1866 (Nov. 30) 1934. Partial Index

Bread: Different Types, Evaluation of Breads Prepared from Bolted and from Unbolted Flours and Comparison of Rye and Wheat Breads. W. Heupke.—p. 1823.

Wakening and Sleeping. J. H. Schultz.—p. 1827.

*Erroneous Diagnosis in Fatigued and Diseased Back. F. G. van Schrick. —p. 1833.

*Chemical Pregnancy Reaction of Visscher and Bowman. J. G. Menken. —p. 1837.

Primary Treatment of Wounds. W. Dracklé.—p. 1838.

Graphic Recording of Red Blood Picture. E. Wiechmann.—p. 1838.

Diagnosis of Backache in Young People.—In evaluating the causes of backaches in young persons, van Schrick calls attention to a postural defect, which he ascribes to a disturbance in the equilibrium between gravity and muscular action, a condition usually accompanied by prolapse of the shoulders, protruding abdomen, concave back and fallen arches. The usual complaints are that the child gets easily tired and is absentminded and weak. The physician commits a grave error if he diagnoses such cases simply as manifestations of growth, for the postural defect may exert a detrimental influence on the general condition. A reform of the school routine would be helpful in counteracting and preventing this disorder. The author shows how the contracted postural defect may be differentiated from the kyphosis of adolescents. In the latter condition a flattening of the sides of the thorax becomes manifest, so that the oval shape of the thorax disappears and it assumes the shape of a trapezium. Roentgenoscopy reveals disturbances of the marginal bands of the vertebral bodies. The author considers the disturbances in the calcium-phosphorus quotient which were observed in these cases an indication that the kyphosis of adolescents is really a late form of rickets, and he found that antirachitic treatment exerted a favorable influence on this condition. He considers a three months rest cure in a plaster-of-paris cast with gradually increasing muscular exercise the most essential measure in this disorder. He advises against creeping exercises. Dull, drawing pains in the back of children with a rather lax posture may be caused by a disturbance in the growth of the cartilages. However, this disorder is rather rare. Percussion pains are manifold and can be elicited in various conditions. The percussion pain that is limited to a small area is generally indicative of a tuberculous process. It is wrong to assume that the formation of a gibbus is necessary before tuberculous spondylitis can be diagnosed. He maintains that one or even several vertebrae may be involved in a tuberculous process without the presence of a gibbus. When the origin of a restricted percussion pain is doubtful, a specialist should be consulted, because the treatment may require years if the development of a gibbus is awaited. In some instances the percussion pain may be caused by osteomyelitis. He stresses the value of roentgenoscopy, particularly for the detection of vertebral fractures. If backaches appear during the third decade of life, a spondylitis deformans may be the cause. This disorder often becomes manifest by an increasing rigidity of the muscles, which results in limitation of thoracic breathing. A wearing down in the vertebral articulations is another cause of backaches. Loosening of the sacro-iliac connections leads to backaches that are extremely refractory to treatment. He discusses sacralization and evaluates changes in the musculature that cause backaches. Sites of predilection of these disorders are between the scapulae, in the lumbar region and at the point of insertion of the gluteal muscles. He calls attention to abnormalities of the pelvis and emphasizes the necessity of a thorough examination of patients with backaches.

Chemical Methods for Diagnosis of Pregnancy.—Menken states that Visscher and Bowman perfected two chemical methods for the diagnosis of pregnancy. The first one is done in the following manner: To 1 cc. of urine is added one drop of a 0.5 per cent solution of hydrogen dioxide. Then five drops of a 1 per cent aqueous solution of phenylhydrazine hydrochloride is added and five drops of a 5 per cent aqueous solution of methyl cyanide, and finally five drops of concentrated hydrochloric acid. This mixture is placed for twenty-five minutes in a boiling water bath. The reaction is positive if a russet color and a flocculent precipitate appear. A straw color and a powdery precipitate or the complete absence of a precipitate indicate a negative reaction. The second method is supposedly more sensitive but also more complicated. To 1 cc. of urine one drop of a 0.5 per cent solution of hydrogen dioxide is added and this is allowed to stand for three minutes. After that five drops of 1 per cent solution of phenylhydrazine hydrochloride is added and then five drops of a 5 per cent aqueous solution of potassium ferricyanide. This mixture is allowed to stand for ten minutes at room temperature and then put into a boiling water bath for fifteen minutes. After that one drop of concentrated hydrochloric acid is added and this is followed by an excess of sodium hydroxide. Then titration is done with diluted hydrochloric acid until the color changes from orange to green and finally to blue. It was found that to produce the final color required much less diluted hydrochloric acid in pregnancy urine than in urine from women who were not pregnant. The author reviews the results obtained by Visscher and Bowman, who obtained 93 per cent correct results, and then describes his own experiences with the first method. He emphasizes that the reagents must be fresh. Contrary to the experience of Visscher and Bowman, his positive reactions generally showed a dustlike and occasionally a somewhat more disperse precipitate. Only once did he obtain a clearly flocculent precipitate. He says that the color was generally dark in positive reactions and light in negative reactions. He thinks that this simple chemical test will be welcomed by the practitioner because it is rapid and dispenses with the use of animals.

Wiener klinische Wochenschrift, Vienna

47: 1409-1440 (Nov. 23) 1934. Partial Index

*Pathology and Therapy of Varicose Syndrome of Rectum. K. Blond. —p. 1409.

Influence of Curvature of Spine on Width and Course of Trachea. J. Schnierer.—p. 1412.

Anuria Following Cholecystectomy (Calculary Occlusion) and Mechanical Icterus Without Operation. A. Hofmann.—p. 1415.

*Juxta-Articular Nodules. M. Wolf.—p. 1420.

Behavior of Leukocytes and of Other Blood Cells in Case of Mikulicz Disease Following Short Wave Treatment. L. H. Stieböck.—p. 1422.

Varicose Syndrome of Rectum.—Blond shows that the customary terms of nodules of the anus, fissures of the anus, periproctitis, erythema of the anus or pruritus of the anus are only morphologic terms for a disease entity, the varicose syndrome of the rectum. In case of stasis in the region of the portal vein, conditions of stasis develop at its origin and it is surely not accidental that in women the first hepatic colic develops following their first pregnancy or that varicose veins or hemorrhoids develop at this time, for the hemorrhoidal plexus belongs to the region of origin of the portal vein. Suppurations in the region of the source of the portal vein, which include periproctitic abscesses, fistulas and fissures, are the port of entry for bacteria into the liver. French authors have called

attention to the high incidence of hepatitis in the anamnesis of diseases of the biliary passages and the author decided to examine cholecystectomized patients from this point of view. Studies in 100 cases revealed the high incidence of existent or of a history of fistulas and fissures in patients who had undergone cholecystectomy. Pruritus ani is often complicated by pruritus of the vulva or of the scrotum and the author points out that this may be explained on the basis of the anatomic connection between the hemorrhoidal plexus and the pudendal plexus. Stasis in the hemorrhoidal plexus and reflux from the system of the portal vein into the region of origin of the inferior vena cava by way of the pudendal, vaginal and uterine plexus may lead to a number of disturbances in the small pelvis, the genesis of which is not entirely clear as yet. It is possible that certain diseases of the female pelvis and of the male genitalia are causally connected, and there is a connection between high hemorrhoids and chronic constipation.

Juxta-Articular Nodules.—Wolf reports the history of a man, aged 34, who developed juxta-articular nodules first on the right hand, then on the left and later on both elbow joints. The predominating localization on the hands is rather unusual but can be explained by the patient's occupation. The disorder is more frequent in tropical regions than in the temperate zone, and the majority of investigators are of the opinion that it is caused by frambesia. In many cases observed in the temperate zone, a connection with syphilis has been assumed. Spirochetes have been demonstrated repeatedly in the nodules of patients in the tropics, but it could not be determined whether they were of the pallida or the pertenue type. In the cases occurring in the temperate zone, the demonstration of spirochetes has not succeeded as yet. One investigator assumed the existence of a fibrotropic strain of spirochetes. In many instances the past history of the patients reveals syphilis in which the antisyphilitic treatment has been inadequate or entirely neglected. The author's patient likewise had had syphilis but had also lived in a tropical region where frambesia is endemic without developing signs of that disease. The fact that the nodules disappeared following treatment with bismuth compounds and arsphenamine seems to be a further indication of their syphilitic origin, and the histologic structure of the nodules seems to point in the same direction.

Zeitschrift für urologische Chirurgie, Berlin

40: 163-210 (Nov. 16) 1934

Scientific Theory and Clinical Problems of Renal Calculi. O. Schwarz. —p. 163.

*Treatment of Schistosomiasis Haematobium. M. Loeweneck.—p. 202.

Treatment of Schistosomiasis Haematobium.—Loeweneck states that patients with schistosomiasis haematobium complain of cystitis that proves refractory to treatment with teas and with urinary antiseptics. Microscopic examination of the urinary sediment clarifies the diagnosis. The author emphasizes that at this point it is inadvisable to force a cystoscopic examination, because it causes hemorrhage and exacerbates the symptoms. Irrigations and instillations are likewise useless and annoying at this period, but the painful vesical tenesmus usually disappears after several injections of an isotonic solution of an antimony compound. This preparation is injected in increasing doses on several successive days, and on about the sixth day it is possible to resort to cystoscopy. If polyp-like granulomas are found, it is generally possible to remove these soft masses and the sandlike deposits, mucus and pus by suction with the Morgenstern instrument. If a hemorrhage should result, it may be arrested by a diathermic sound introduced through the irrigation canal. The injections of the antimony compound are continued. The mixed infection is counteracted by irrigation, and in approximately three weeks the patient is free from symptoms. In a patient observed by the author, a control examination after four weeks revealed that eosinophilia had persisted and that ova were still present in the material withdrawn by suction, although the patient was free from subjective symptoms. A new series of injections with the antimony compound was instituted and the eosinophilia gradually disappeared. The antimony compound was well tolerated. The author emphasizes that the disappearance of the eosinophilia is the only reliable sign of cure.

Bibliotek for Læger, Copenhagen

126: 481-522 (Nov.) 1934

Causes of Blindness on Faroe Islands. R. K. Rasmussen.—p. 481.

*Investigations on Mechanism of Albuminuria: II. (Albumin-Globulin Quotient). J. Bing.—p. 497.

*Albuminuria and Histogenesis of Nephrosis. J. Bing.—p. 508.

*Studies on Significance of Macrophages in Malignant Tumors. W. Munck.—p. 514.

Mechanism of Albuminuria.—Bing's observations support the modern conception that the mechanism of albuminuria depends on a filtration of plasma proteins through degenerated glomeruli. Accordingly he considers the histogenesis of nephrosis best explained by invasion and storage, during the work of concentration in the tubuli, of plasma proteins (and plasma lipoids), which are filtrated through degenerated glomeruli in the glomerulus filtrate.

Macrophages in Malignant Tumors.—Following his experimentation, Munck presents the following working hypothesis: In the growth of malignant tumors there is caused in the surrounding tissue a mobilization of mesenchymal cells originating partly from the tissue itself, partly from the blood, which appear in large numbers as large mononuclear ameboid cells. These macrophages are functionally connected with the reticulo-endothelial system and with regard to the tumor tissue exercise a function which consists partly in taking up various substances, including degeneration products from the tumor cells, and partly in contributing to the formation or further production of the substance that is important for the growth of the tumor cells. In epithelial malignant tumors the function of the macrophages is of secondary importance and the nature of the tumor is primarily dependent on the epithelial elements. In mesodermal malignant tumors the macrophages seem to constitute a functionally important link between the tumor cells and the normal cells and are the main place of formation of the substances on which the malignity of the tumors depends.

Hospitalstidende, Copenhagen

77: 1349-1408 (Nov. 27) 1934

*Contribution to Clinic of Intestinal Disorders: II. Significance of Catalase (and Triboulet) Reaction in Diagnosis and Prognosis. S. Kemp and T. T. Andersen.—p. 1349.

Significance of Catalase in Intestinal Disorders.—Following investigations on the catalase relations in the feces in 1,716 cases of intestinal disorders, Kemp and Andersen conclude that practically only the catalase values which show a marked increase are of diagnostic and prognostic significance. The main diagnostic importance of the catalase reaction in intestinal disorders is in directing attention to the possible presence of a deep-seated organic disturbance, especially when the reaction is pronounced and confirmed on repeated examinations. Continued normal catalase values testify against but do not exclude a grave intestinal disorder, particularly when there is a possibility of "latent" tuberculosis. The quantitative catalase determination supplements the results of rectoscopy, examination for occult blood and roentgen examination, and in many intestinal disturbances, including grave disorders without ulcerations, neoformations or stenosis, it is the best objective criterion of the more or less grave nature of the disturbance and of the results of treatment. In ulcerous intestinal disorders the catalase reaction gives a more reliable impression of the entire course than the more accidental occult hemorrhage when positive and negative results vary. The marked catalase reaction, which except in grave manifest hemorrhage is probably never due to gastric ulcer, is also useful in distinguishing between gastric and duodenal ulcer. The catalase reaction is preeminently indicated in (1) all chronic diarrheas, (2) obstinate colitis with constipation, especially when there is proctitis, (3) suspected cancer or tuberculosis of the intestine and (4) acute specific intestinal infections, particularly in convalescence, for control of the results of treatment, and (5) as a supplementary examination in chronic and acute amebic dysentery. The Triboulet reaction in its marked positive form is almost synonymous with grave, usually purulent, intestinal disorders, but its infrequent occurrence (except possibly in intestinal tuberculosis) considerably lessens its value in practice. The qualitative catalase reaction is of doubtful value.